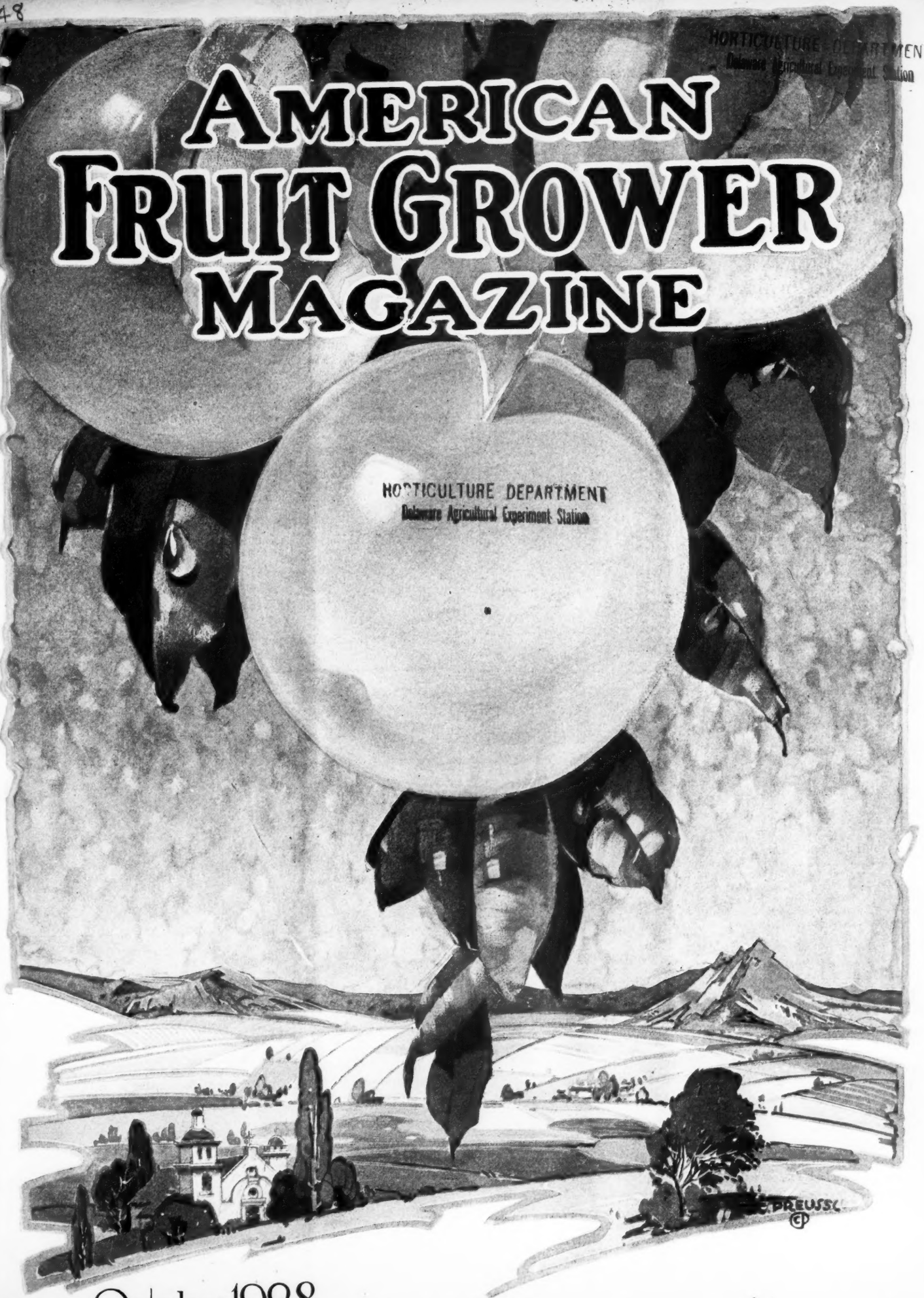
148

HORTICULTURE DEPARTMENT
Delaware Agricultural Experiment Station

AMERICAN FRUIT GROWER MAGAZINE



October, 1928
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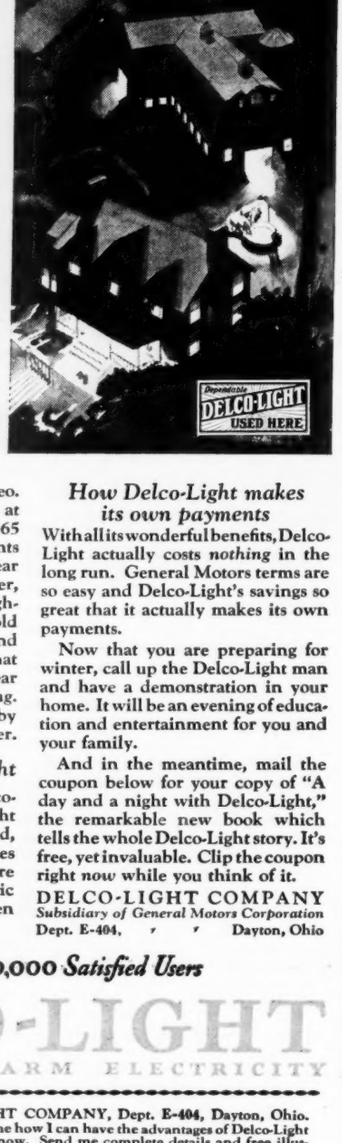

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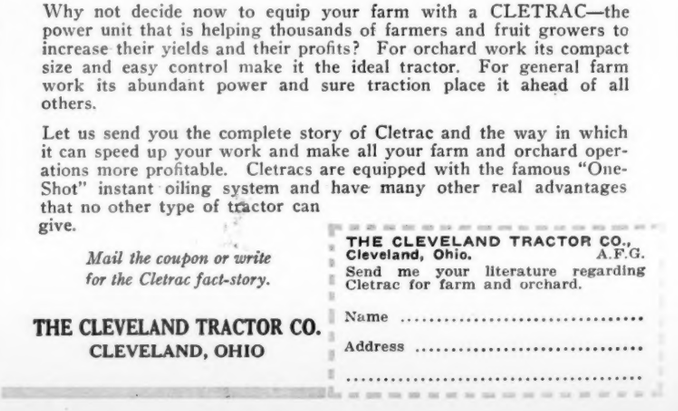

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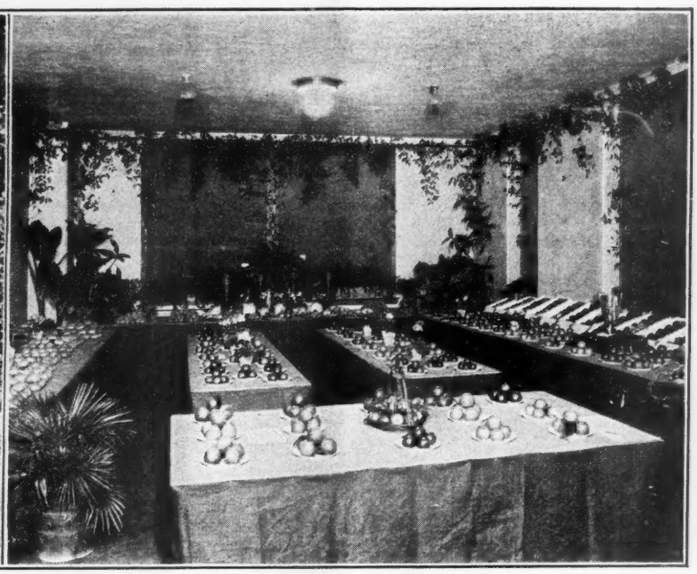
Picking, grading and barrel packing apples in the orchard



An attractive exhibit of apples

PICKING, HANDLING and EXHIBITING The APPLE.

By J. J. TALBERT

University of Missouri

The Keeping Qualities of Apples Are, to a Large Extent, Determined by the Condition of the Fruit as to Ripeness, When Picked, and the Care Exercised in Handling. Points to Be Considered in Selecting Apples for Exhibition Purposes

PICKING, handling and exhibiting apples may be summarized as follows: Produce the best quality of fruit possible. Pick it when it will make the highest quality and most attractive product. Handle carefully at all times and keep it as cool as possible after picking.

Apples should be picked for market when hard ripe. Hard ripe means that the fruits have not softened to any extent, but are mature enough that they will soften and become eating ripe after picking Picked too late these fruits soften eitner on the tree or soon after picking, and as a consequence break down and decay. On the other hand, it picked too early, they have poor color and eating quality when they are eating ripe, and are more subject to diseases in transportation and storage.

There are limits on either side of the proper time to pick fruit. These are easy to recognize, and economic necessity forces fruit growers to observe them. Fruit should not be picked before it has attained fair size and color, because the grower cannot generally sell it to advantage. Fruit should not be left on the tree until it drops, for fallen fruit as a rule cannot be sold at a satisfactory price. For best results, fruits must be picked between these two stages. One of the best indications that apples are ripe enough to pick is the change of the ground color from green to yellow. Immature fruit is leaf green. Some varieties never have any red color, but most varieties develop more or less red color as they ripen. The green is called the ground color. The red, which appears later, is called the over color. When fruit is eating ripe, the green color has become yellow. This change begins, however, before the fruit is eating ripe, and about the time it is hard ripe. In general, the fruit is ready to pick when the green ground color takes on a tinge of yellow.

Barrelled apples going promptly from the packing shed to a co-operative cold storage plant. A necessary marketing step.

An instrument known as a fruit pressure tester is now being used to determine the hardness and softness of apples and other fruits. Growers and investigators have found its use valuable when supplemented by known characters of fruit ripening.

The determination of the proper time to pick fall and winter apples is more difficult than is the case with summer apples. The different varieties offer different problems. Some varieties, of which Jonathan is an example, become hard ripe relatively early; others ripen later. Some suffer in keeping quality if picked too late; other varieties keep if left on the tree until relatively late. Jonathans tend to soften on the tree and suffer from Jonathan spot and decay after picking if left too long. It is best to harvest them as soon as they have developed good size and color. During a hot, dry fall they tend to drop badly, and may start to drop before they have colored. When apples which are uninjured by insects or diseases start to drop of their own accord, the crop must be picked to save it, regardless of size and color. Other varieties, like Winesap, Ben Davis, York, Ingram, etc., become picking ripe later in the season than Jonathan. They increase in size and red color through the season. With most varieties, it is best to leave the apples on the tree until the yellow ground color develops to some (*To Page* 18)

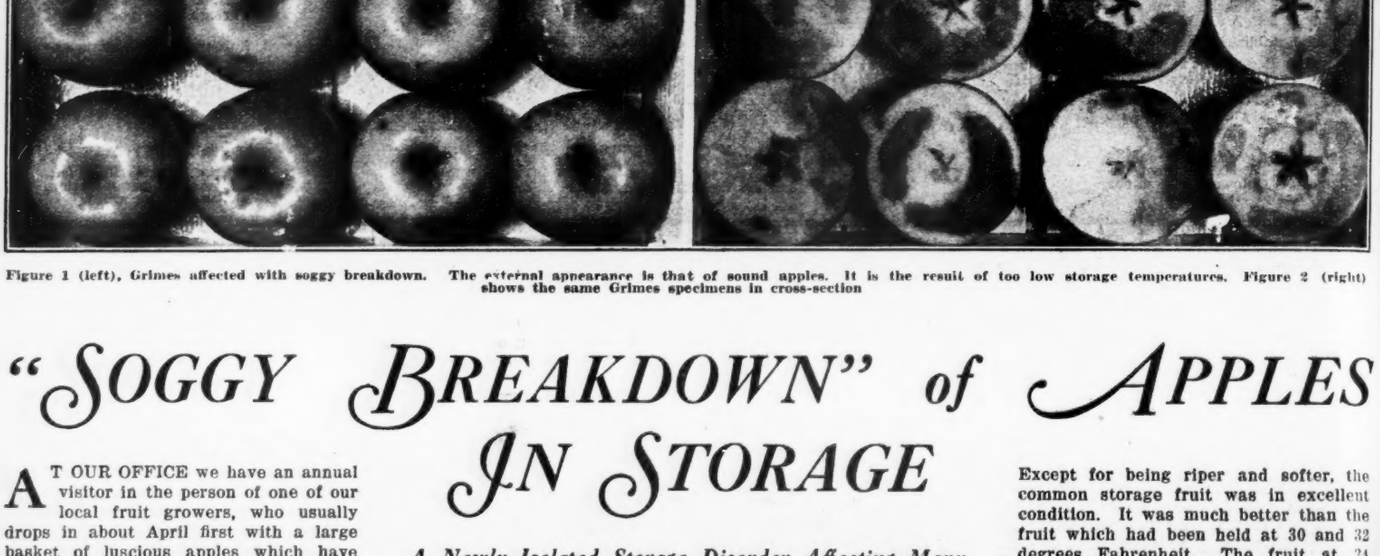


Figure 1 (left), Grimes affected with soggy breakdown. The external appearance is that of sound apples. It is the result of too low storage temperatures. Figure 2 (right) shows the same Grimes specimens in cross-section

"SOGGY BREAKDOWN" of APPLES IN STORAGE

A Newly Isolated Storage Disorder Affecting Many Varieties of Apples and Apparently Caused by Too Low Storage Temperature. A Type of Internal Breakdown, But Differing from "Mealy Breakdown"

B. H. H. PLAGGE

Iowa Experiment Station

AT OUR OFFICE we have an annual visitor in the person of one of our local fruit growers, who usually drops in about April first with a large basket of luscious apples which have reposed during the winter season in his farm storage. At first the visit was just an occurrence, but now it has become almost an occasion, and the office force always looks forward to the April Fool joke, which in reality is not a joke at all, but the occasion for argument, and a lot of good discussion about the merits of cold and common storage for apples.

Our grower friend always looks over with scorn our specimens of mealy breakdown, Jonathan spot and what not from the cold storage plant and holds them up as horrible examples and victims of scientific procedure. He has stored the leading commercial varieties for 10 years at his farm and "by heck" his apples have never developed these common storage troubles at any time. Here is a case where apples have kept better under air-cooled storage than under cold storage conditions.

The above experience with common storage seemed worthy of investigation and consequently, in the fall of 1924, we placed 50 boxes of apples in the air-cooled storage at this grower's farm near Ames. The varieties were Jonathan, Northwestern Greening, Grimes Golden, Arkansas (Mammoth Black Twig) and Wealthy. Some apples of each variety went into storage one or two days after they were picked. Other lots of the same varieties were stored after a delay of one week in the packing shed at the orchard. Two other lots of each variety were reserved for a delay of two and three weeks before storing. As a comparison with cold storage fruit, apples from the same lots of all varieties were placed in five different cold storage rooms under five different temperatures at 30, 32, 34 and 40 degrees Fahrenheit. As under air-cooled storage, some sub-lots were stored immediately while others were given one, two and three weeks' delay before storing. Careful records were kept of the temperatures and relative humidities of all the cold storage rooms and of the air-cooled storage house.

Results of Experiments in 1924

In January, all of the apples in these experiments were placed on a table for inspection. The main points considered were the physiological disorders, breakdown, soft scald, apple scald and Jonathan spot, as well as eating quality, hardness, color and market value.

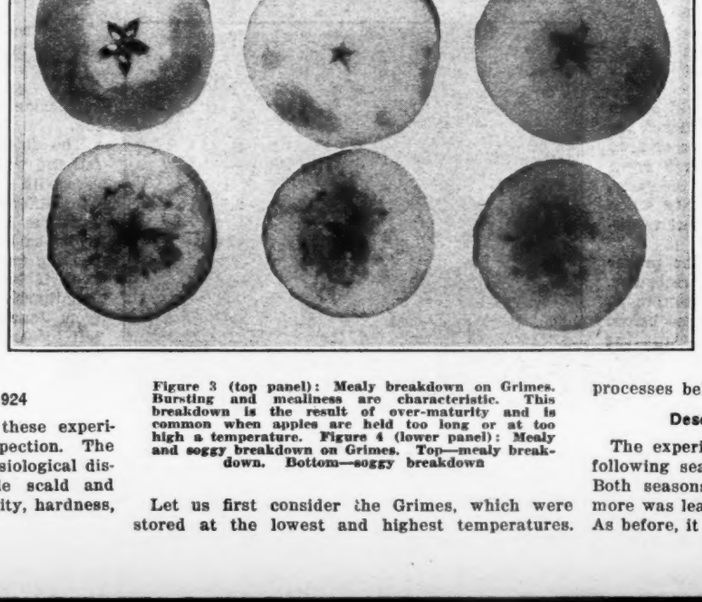


Figure 3 (top panel): Mealy breakdown on Grimes. Bursting and mealiness are characteristic. This breakdown is the result of over-maturity and is common when apples are held too long or at too high a temperature. Figure 4 (lower panel): Mealy and soggy breakdown on Grimes. Top—mealy breakdown. Bottom—soggy breakdown

Let us first consider the Grimes, which were stored at the lowest and highest temperatures. Except for being riper and softer, the common storage fruit was in excellent condition. It was much better than the fruit which had been held at 30 and 32 degrees Fahrenheit. The fruit at 34 and 36 degrees Fahrenheit kept perfectly, the texture was firm and the eating quality was excellent. At 30 and 32 degrees, a large part of the Grimes became soft, mushy and brown. In some instances, over one-half of the fruit became affected.

Since the trouble noticed was absent in the common storage fruit and at the higher temperatures, one might conclude that the apples had been frozen. However, this was not the case, as apples do not freeze at temperatures above 28.5 degrees Fahrenheit. Since this temperature was never reached in any part of the storage rooms, the only other conclusion in order is that some other physiological disturbance had taken place. This undoubtedly was the case, as we shall see from other experiments. Wealthy also showed the same effects as Grimes. Jonathan and Northwestern Greening became severely affected with soft scald at 30 and 32 degrees, but Arkansas (Mammoth Black Twig) kept favorably under the various storage conditions.

A New Storage Disease Recognized

The Grimes, which were examined in January, 1924, were placed back into storage until late in March. Upon second inspection, the Grimes were found to be still sound at 34 and 36 degrees, and still sound in most instances in the common storage. However, an additional amount of the soft breakdown had occurred at 30 and 32 degrees. The fruit in common storage was becoming mealy and in a few specimens soft and discolored. This was not the case with apples stored at 36 degrees. Physiological breakdown brought about by natural ripening was beginning in the common storage lots of fruit. However, this was not the same disorder which had occurred three months earlier at the lower range of temperature. It was plain that a type of breakdown had occurred at the lower temperatures, which was due to the fact that the apples could not complete their life processes below a certain temperature level.

Description of the New Disease

The experiments of 1924 were repeated the two following seasons but on a more extensive scale. Both seasons the same result was obtained and more was learned of the nature of the new disease. As before, it occurred extensively (To Page 00)

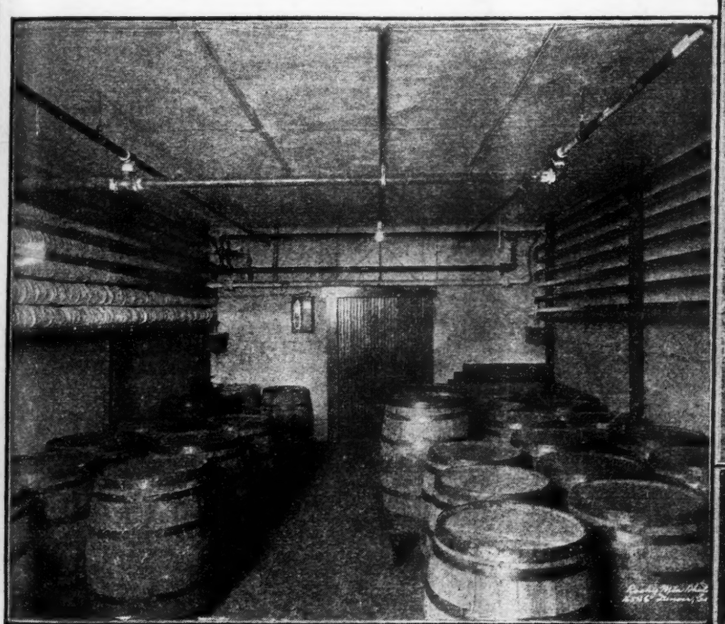
INSULATION INSURES ECONOMY in the FRUIT STORAGE HOUSE

The Storage House Is Kept at Low Temperature, Not by Putting Cold in, But by Taking the Heat Out and Keeping It Out. The Principles of Fruit Storage Insulation.

By H. B. GATES

COLD STORAGE of fruits and vegetables, strange as it may seem, often starts before these products are grown. It has been found that the germination of seeds can be much better controlled when the seeds are kept at low temperatures. Government experiments demonstrated that apple seeds held at 41 degrees Fahrenheit for 75 days germinated, whereas those kept at 50 degrees or over did not. The same is true of the seeds of other plants and applies equally to the development of cuttings and young plants. These latter can be held back by regulation of temperature and sent out for planting at exactly the proper stage.

During the period of growth, of course, cold storage has no part, but from the time the harvesting begins until fruits and vegetables pass into the retailers' hands, it is a very important factor. Cold storage not only stabilizes the market and makes seasonal products available the year round, but it conserves from loss enormous quantities which would otherwise rot on the ground for want of an immediate and nearby market.



Cold storage room in a Denver storage warehouse. The slabs of cork insulation can be seen on ceiling and walls.

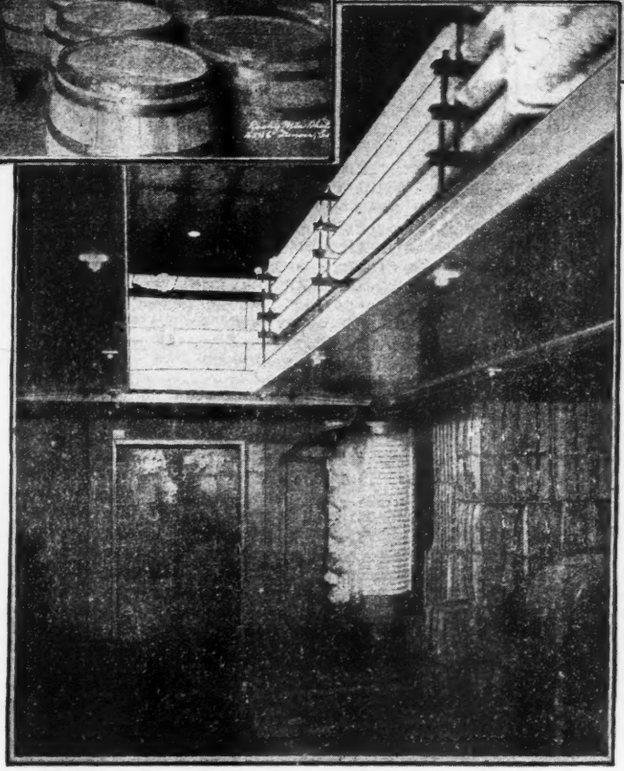
Cold storage rooms vary considerably in the fruit and produce industry—the individual plant of the grower; the huge precooling plants of the citrus districts; the refrigerator car; the centralized warehouses, such as in the apple countries, and finally the cooling rooms of the wholesale distributors. All of these are alike, however, in two particulars: They must be refrigerated, by ice or machine, and they must be so constructed and *insulated* that the desired temperatures can be held economically.

The Importance of Insulation

This article deals with insulation and insulation construction, the principles of which are exactly the same for every kind of low-temperature room. They are very simply explained.

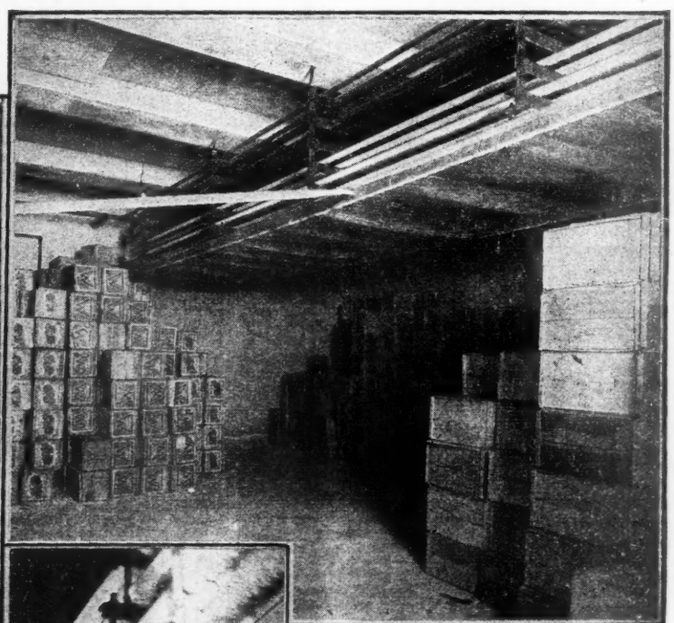
A room is refrigerated, not by putting cold into it, but by taking heat out. Heat is absorbed by melting ice and carried off by the drainage. In mechanical refrigeration, the refrigerant, brine, or ammonia, or other expanding gas, takes up the heat, carries it outside the room and gives it up in the compressor and condenser.

It follows that the less heat there is to be removed, the more economically the work can be done. Necessarily, the heat that goes into the room in the products stored must be removed, and this factor cannot be controlled. The only heat factor that can be reduced and controlled is the heat that leaks in through the walls, ceilings, and floors, and at openings. It is this in-leaking heat that makes up by far the greater part of the total to be removed. The more it can be reduced, therefore, the less refrigeration will be required to hold the temperature reasonably constant at the required point.



Interior of produce room in a Raleigh, N. C., cold storage, showing ceiling and bunker construction and method of storing cases for air circulation.

The problem, then, is to reduce the heat leakage inward through the construction, and this can be done only by adding to the walls, floor, and ceiling some material that has a higher heat-retarding value than the brick, concrete, stone, or wood of which these are ordinarily built. Such materials, having a very low heat conductivity, are known as insulators, or insulation. Corkboard, for example, which is the most widely used insulation and generally recognized as the most efficient and durable, is so resistant to heat transmission that one inch of it is equal in heat retarding value to a brick wall 16 inches thick. The thickness generally used for fruit storages, four inches, is therefore the equivalent of 64 inches of brick.



The apple room in a Ft. Worth, Tex., cold storage. Walls, partitions, floors and ceiling are insulated with two thicknesses of two-inch corkboard.

It is obvious that the heat leakage through such construction is so small that very little refrigeration is needed to offset it. Practically all of the refrigeration that need be supplied to a well-insulated room is that required to take the heat from the goods put into storage. Refrigerating cost is therefore reduced to the minimum by the use of good insulation, and enough of it. In other words, it is cheaper to *keep* heat out of a room with insulation than to *take* it out, mechanically or with ice, after it gets in.

Corkboard Insulation

Corkboard is the material almost universally used for the insulation of cold rooms. This is not only because it has a very high insulating or heat-retarding value, but because it also possesses certain other equally essential properties. Most important of these is its nonabsorbence or resistance to moisture. Any material that will not remain perfectly dry has no permanent value as insulation. Moisture soon destroys its insulating efficiency, and so weakens the material that it can not be kept in place. Corkboard, (*To Page* 20)

BREEDING NEW FRUIT VARIETIES

The Advantages of Some of the New Fruit Varieties Developed at the New York State Experiment Station Over the Older Sorts. The Conclusion of Doctor Hedrick's Interesting Paper on the Station Work.

By U. P. HEDRICK

New York Agricultural Experiment Station

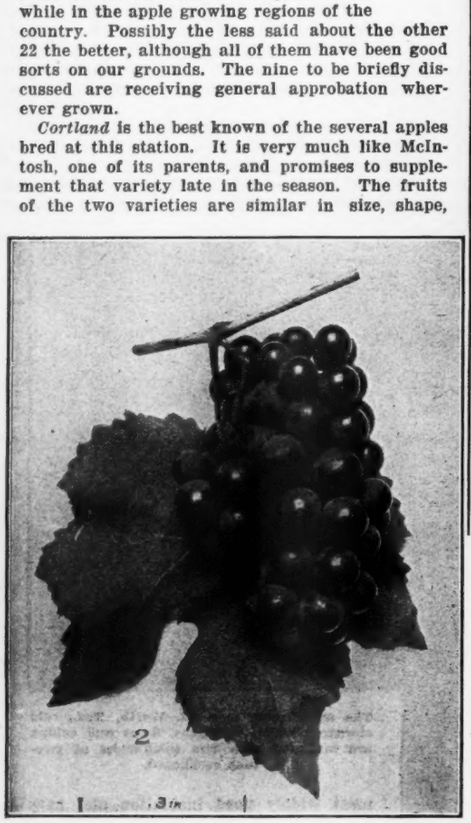
PART II

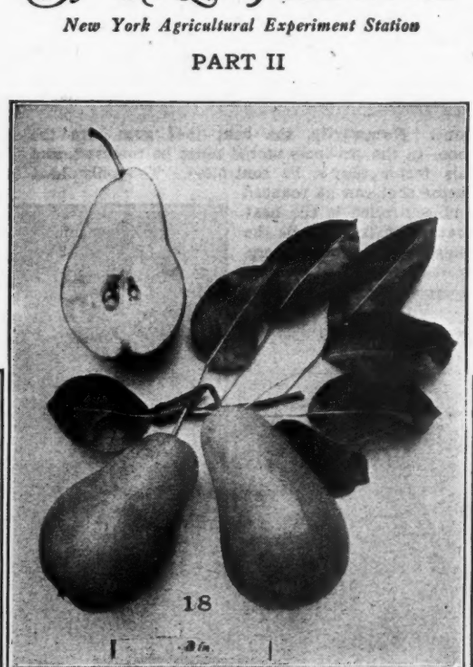
SOME of the fruits that have originated at the New York Agricultural Experiment Station, and which have been, or are now being introduced, and which the writer thinks have distinct advantages over any of their competitors, will be discussed in the following paragraphs. I will begin, of course, with apples, chiefest of hardy fruits in North America.

Apples

This station has named and sent out for general testing, 31 varieties of apples. Nine of the 31 seem to be quite worth while in the apple growing regions of the country. Possibly the less said about the other 22 the better, although all of them have been good sorts on our grounds. The nine to be briefly discussed are receiving general approbation wherever grown.

Cortland is the best known of the several apples bred at this station. It is very much like McIntosh, one of its parents, and promises to supplement that variety late in the season. The fruits of the two varieties are similar in size, shape, color and taste. The season of Cortland is several weeks later and the apples do not drop so readily and ship better. The trees of the two varieties are much the same and thrive in the same soils and climates and under the same treatment. Cortland promises to take the place of Baldwin in regions where McIntosh and Baldwin are grown.





Three of the new fruit varieties are shown here. The Pulteney pear, shown above, is a late variety, superior to the Bartlett. The Sheridan grape, at the left, surpasses the Concord in quality and productiveness. The Stanley plum, at the right, can hardly be improved upon.

Early McIntosh was bred to give fruit growers a good, early red apple. This new sort is a McIntosh ready to eat in August. Color, shape and taste are much the same in the two varieties. The trees of Early McIntosh are vigorous, healthy, hardy, productive and bear annually. The crop ripens 10 days or two weeks later than that of Yellow Transparent, which is one of the parents, McIntosh being the other parent. The apples hang on the trees better than in Yellow Transparent and keep and ship much better.

Lodi is another Yellow Transparent hybrid of the same type as its parent, but it is larger and has a more pleasing flavor. It ripens a little later than Yellow Transparent, thus prolonging the season of that variety, over which it is an improvement in that the tree is better and the apples are much larger, more uniform, keep longer and are of better quality.

Macoun is a new sort which produces a late crop of McIntosh-like apples and prolongs the Cortland season, coming to maturity in common storage a month after Cortland. Here again the fruits are very similar to those of McIntosh. The trees bear regularly and heavily. Macoun promises to be an apple of great merit, having only the fault that in some soils the fruits run a little smaller than those of McIntosh.

Milton, a sister plant to Early McIntosh, ripens its crop midway between Early McIntosh and McIntosh. The trees are very similar to those of Early McIntosh, but the fruits are even handsomer because of the brighter red and heavier bloom. The quality is much the same as that of McIntosh. Early McIntosh, Milton, McIntosh, Cortland, and Macoun should give a McIntosh-like apple for every day in the apple year.

Orleans is a cross between Delicious and Deacon Jones. Orleans promises well as an apple of the Delicious type to prolong the season of that variety. On the grounds of this station the fruits average much larger and are much brighter in color than those of Delicious. The shape of the fruit is like that of Delicious, and the apples have the same delectable flavor.

Red Sauce is an interesting curiosity and yet may have value. The flesh is red to the corelines and makes a sauce as red as that of cranberries. The apples are too tart for dessert but are excellent for culinary purposes. The fruits are large, round-conic, and covered with solid red. The crop ripens with that of Baldwin.

Sweet Delicious was bred to furnish a good red sweet apple. The fruits of the new variety resemble Delicious in every character, even in flavor and aroma, but are sweeter.

Sweet McIntosh is another apple of the McIntosh type with the same flavor and aroma but markedly sweet. It is a little earlier than Sweet Delicious. These two new sweet apples are splendid sorts for home and roadside markets, and have been bred to stimulate the demand for sweet apples, fruits which seem to have been going out of fashion in late years.

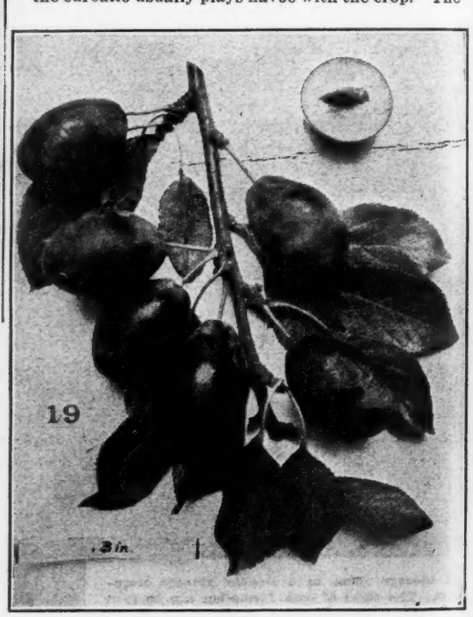
Cherries

This station has not yet accomplished much in breeding cherries, although much might be done both for sweet and sour sorts. Efforts are being made to breed a sour kind to take the place of Montmorency, which runs too small and is usually injured by late spring frosts. The station is trying also for a hardier, more productive, and a larger sweet cherry. No new varieties are in sight that come up to expectations to fill these two places, but meanwhile a remarkably sweet cherry has been bred.

Seneca is a new cherry noteworthy because of extreme earliness. Its fruits ripen in the first weeks of June, more than two weeks earlier than Black Tartarian, which has long been the standard early cherry. The cherries of Seneca resemble those of Black Tartarian in every character. The fruits do not crack and are not subject to brown rot, troubles that play havoc with sweet cherries ripening later. The tree is exceedingly productive and promises to be one of the largest of all sweet cherry trees. Seneca has been well tried in many cherry regions and is commended by all as a cherry for both home and market.

A Nectarine for American Fruit Growers

Nectarines have been little grown on this continent east of the Rockies for the reason that the curculio usually plays havoc with the crop. The curculio, however, is now easily controlled by spraying, and there are no reasons why the nectarine should not become as popular as the peach, as in the old world where nectarines are everywhere as commonly grown as the peach. The nectarines grown for the past 200 years in America have all been of European origin and not at all suited to American conditions. It seems desirable, almost imperative, that this station try to breed better nectarines than these foreign sorts.



Comparatively few growers in the eastern part of America know the nectarine. It is a smooth-skinned peach; the fruits probably run a little smaller and the flesh is usually sweeter and richer. The tree does not differ in any character from that of the peach and will thrive wherever peaches thrive. Like the peach, there are freestone and clingstone varieties, and white-fleshed, yellow-fleshed, and red-fleshed nectarines.

Hunter is the first nectarine to be offered. The tree is large, vigorous, hardy, healthy and productive, and thrives in any soil or climate where peaches succeed. The fruits are large, handsomely colored, excellent in quality, and ripen in mid-season. Hunter is the first of what it is hoped will be a long line of nectarines bred at this station for American conditions.

Pears

The chief aim in the work of breeding pears at this station is to obtain varieties less susceptible to blight than any of the standard commercial sorts. Seckel has been the commonest parent used in breeding pears because it has (*To Page* 14)

Wiring the Fruit Farm Home

Since Electricity from Individual Electric Plants Is Being Used for Many Power Needs Around the Home, the Arrangement of Electric Outlets Should Receive Consideration When the Wiring for the Dwelling House Is Being Planned

By S. M. BALLARD

CAREFUL advance planning is just as necessary for a good job of home wiring as are the actual wiring materials. The planning is best done in a round-table council of the whole family, for each member will develop suggestions that otherwise might be overlooked and leave a serious gap in the home's electrical facilities when the wiring is installed and in use.

Electricity is a material aid in supplying many of the conveniences in the modern fruit farm home. The best time to make such conveniences available is when a dwelling is being constructed or remodeled, but there is relatively small difficulty in installing wiring where the home is already completed.

The inclination to build the home first and let the wiring be installed at some future date is more prevalent in the rural sections of the country than in the cities. This is due partly to the farmer's belief that any hurried, haphazard method of wiring can be installed at any time he may want electricity. Such a practice almost invariably results in dissatisfaction when the wiring is finally installed, and usually leads to the inefficient wiring being torn out and an adequate system of wiring put in. It is much better to plan the home wiring thoroughly in the first place and carry it through to completion for permanent and satisfactory use.

Since the individual electric plant is available to every farm home, it is inadvisable to postpone wiring of either a new or completed house on the plea that electricity is not an immediate possibility. With the growing appreciation of the many uses to which electricity can be put on the modern farm, and in the truly efficient farm home, it is poor economy to omit the wiring that will make this convenience a part of the family life immediately.

Since electricity from individual electric plants is being used for many power needs around the home, as well as for illumination, the arrangement of electric outlets for both requirements should receive consideration when home wiring is being planned. The amount of voltage to be carried by the wiring is another important consideration. It should be remembered that wiring for a 32-volt farm electric plant will carry a 110-volt load if this latter type becomes available through later investment in a 110-volt plant or if 110-volt electricity becomes accessible to the farm in any other way. On the other hand, if the home is wired for 110-volt current, this wiring will not carry 32-volt current, should this current be used at a future date. For that reason, it is generally safe practice to wire for 32-volt current and care for almost any future need.

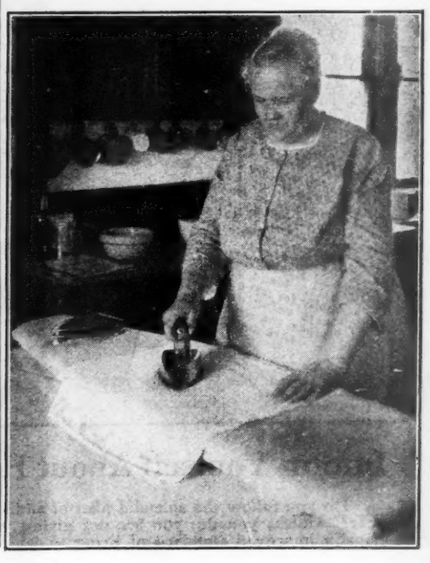
Let us consider in the remaining paragraphs just what the family should plan for when it settles down for a talk about this question of home wiring.

There should be plenty of switches, since their convenience encourages the turning-off of lights that might be allowed to keep on burning if the switches are not within reach. It is best to have switches as near the doors as possible, for convenience on entering and leaving.

The hall or stairs may be overlooked in a casual planning of wiring. Yet it is most essential that they be illuminated, since good lights on stairs prevent accidents and ample hall illumination makes the first pleasant impression on guests and enables the family and visitors to find their way about the home easily.

Many users of individual electric plants install electric lights in clothes closets, the darkest spots in most homes. The use of pilot switches, which turn lights on and off in a room other than that in which the switch is located, saves time and steps. Such switches are convenient at the foot of stairs or at the top of stairs when it is desired to illuminate downstairs rooms before descending.

Base and wall receptacles should be planned with care, for on their proper distribution in the home depends much of the convenience in the use of (*To Page* 21)



Picking and Packing Apples for Market

By R. B. RUSHING

THE BEST METHOD of picking apples that I have ever tried is picking them into baskets. The baskets should be of the round, half-bushel type and should be equipped with drop handles. The baskets should be smooth on the inside—that is, free from strips around the inside or bottom. They should be lined with burlap to prevent bruising, and a short iron hook should be attached to the handle for suspending the basket from the limb, so as to enable the picker to use both hands. The great advantage in using a basket, I find, lies largely in the fact that if the apples are carefully placed in the basket they will not bruise. The greatest objection that I have to baskets is that they are not as handy as sacks and sometimes careless pickers are disposed to toss apples into them as they set upon the ground or hang from a limb a few feet away.

My experience has been that apples packed from the grading table and immediately placed in cold storage (if they are to be held in this manner) will come out in the best condition. This method adds from two to four months to the keeping quality of the fruit. You cannot afford to let your fruit lie under the tree or in a building for two or three weeks before you barrel it. Every day's delay in packing and shipping will cost you money and diminish the quality of your fruit, and if you are not the loser, the purchaser is. Fruit grown in a warm latitude or harvested during a warm fall should be quickly handled at picking time and there will not be much room for complaint from the consumer.

A good barrel is essential if you wish to store your fruit in this manner. It should be tight, and the stronger it is made the better results you will have in handling apples, because there will be less loss from shrinkage of fruit, from rats, mice and other causes.

In my orchard I have eight pickers and six sorters and barrelers in each gang. A good strong table constructed of light material is provided. This table is located conveniently between 16 trees. If the fruit is scarce and the trees are very small, the table is set in a place central to 24 or 36 trees. Four or six rows are carried forward at once and the table is moved along the center rows and set in the middle of the square at each move.

I usually have one man who nails the hoops and headliners and takes out the heads of the barrels to be filled. It is quite important to have these headliners, as they often prevent loss in shipping and they facilitate the examination and inspection of the fruit in storage.

This man usually heads up the (*To Page* 21)

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The Market Review

By PAUL FROEHLICH
United States Bureau of Agricultural Economics

OCTOBER is apple month. Harvesting, shipments and storage of this fruit probably will be at their height during the present month. Apples, along with grapes, hold the center of the stage in October. Movement of boxed apples during early September was rather light, but shipments in barrels were rapidly increasing. Grape output was very active and was catching up with last season's early record.

Peach supplies were much heavier than a year ago, though lighter than during August. Pears continued in rather heavy volume; plums and prunes were in ample supply. The 1928 citrus season was opening slowly. Prices have been at a rather moderate level for most fruits, though some lines were advancing as their season approached an end.

Active Picking of Apples

In orchards all over the country, apples are being harvested as rapidly as they mature. As in previous seasons, some fruit was rushed to export markets before reaching a desirable stage of maturity. The Virginias and New York had become leading shipping states for eastern apples during the forepart of September, though Arkansas and Illinois were very active and the Michigan crop was getting under way. About 20 states east of Colorado were contributing to the market supply, as against half a dozen states in the West. Washington and California were chief sources among the western group.

The northwestern boxed apple market was opening cautiously, with very few orders actually booked. Large sized, Extra Fancy Jonathans were going at $1.25 per box, Fancy stock at $1, and C grade at 75 cents. Similar grades of Delicious were being booked at $2.25, $2 and $1.50 per box, while a few large Romes have been sold at $1.50, $1.25 and $1, depending on the grade. Extra Fancy, medium to large Winesaps were selling at $1.40. For Jonathans and Delicious, these f.o.b. prices are about $1 lower than sales made during late August, 1927. Idaho apples appear to be of better quality than last season; Jonathans have been moving during September. Bushel baskets of best Oldenburgs were bringing only 85 cents in southwestern Michigan producing districts, with Wealthys at $1.25. Trade reports indicated Potomac Valley apples of various varieties being quoted at an f.o.b. range of $3-$5 per barrel. Certain varieties of eastern apples will be short this season, particularly Baldwins and Northern Spys. Michigan also reports a rather light crop of Greenings. City jobbing sales, early in September, were mostly at 90 cents to $2 per bushel basket, with some Arkansas fruit as high as $2.50. A few quotations on barrels showed a range of $3-$5.25.

An interesting experiment by a fruit company in promoting sales of apples is the special house, built in the shape of a large apple, near the main highway at St. Joseph, Mo. It is 35 feet high and 32 feet across, with ample parking space and tourists' cabins nearby. The ground floor is a salesroom for apples, cider, and other apple products. The second floor and basement are arranged into storage rooms, and rooms for the cider presses. Apples and cider will be on sale the year round.

The Export Situation

When considering apple exports, attention must be given to the Canadian crop, as well as to the production in United States. Usually, from 10 to 15 per cent of the commercial apples grown in our own country are exported. Last season's exports were light, totaling only 1,348,530 barrels and 5,384,330 boxes, or 12 per cent of the commercial production. During recent years, Canada has exported one-third to one-half as many apples as the United States, or a much larger percentage of its commercial crop. Fruit from the two countries competes actively in British markets and elsewhere. According to August condition, Canada expects a commercial crop of 2,938,970 barrels, or about four per cent more than in 1927. The crop, however, is only 93 per cent of the five-year average and is but nine per cent as great as the commercial crop in the United States. British Columbia expects heavy production and good quality fruit, while crops in eastern provinces are below average and of variable quality. British Columbia will show a 33 per cent increase over 1927. Canadian apples, generally, promise to be of good size and color.

Continental fruit crops suffered further deterioration during August, especially as a result of drought in the southern regions. The continent of Europe, as a whole, expects only a medium to small crop of apples and pears. These markets, therefore, should be in position to take American fruit earlier in the season than usual. The southern districts of Germany experienced a heavy drop, and the surplus there will be limited.

Early arrivals of American apples have been bringing fair prices in Great Britain. Glasgow reported California Gravensteins at $2.80-$3.15 per box during the latter part of August. York Imperials from Virginia sold at $5-$5.85 per barrel, while eastern Greenings brought as much as $8.75. In general, the British market outlook for cooking apples continues good.

Very important suggestions for growers and shippers, who send part of their crop to foreign markets, will be found in a recent report by Edwin Smith, entitled "Summary of the Apple Export Season, 1927-28." Copies of this mimeographed summary can be had from the Bureau of Agricultural Economics, Washington, D. C. The report covers thoroughly every important phase of the apple exporting business.

The Department of Agriculture has issued definite "Standards for Export Apples," which also should be in the hands of all shippers. These standards have been endorsed by the leading national organization interested in apples, and will help exporters to have fruit arrive overseas in the best possible condition.

Grape Shipments Heavy

Late September and early October is the most active period for grape shipments. Last season, the weekly output at this time sometimes amounted to 10,000 cars. The Ozark region is about finished by October, but California is in the midst of its annual rush, and Michigan, New York and Pennsylvania are becoming very active. The season's movement of Ozark grapes was forecast at 2800 cars, compared

with about 225 last year when the crop was frozen out. Actual shipments will depend largely on market conditions. Shipping points were quoting four-quart baskets of Concords at 15 cents and 12-quart baskets at 35 to 40 cents during early September. Very few cash sales were being made of table grapes at California points. Zinfandel and Alicante Bouschet juice stock was returning $47.50-$50 per ton, including lugs, while Muscats sold for cash on track at $26.50-$30. Demand was improving as the season advanced. Every effort will be made to hold California shipments within a limit of 65,000 cars.

Pre-season reports from Michigan indicated that 3300 carloads of grapes might be moved from that producing district, as against 2020 last year and 3000 cars in 1926. Concord shipments were expected to start by September 20, with peak movement about October 5. Quality of Michigan grapes is said to be only average. Peak shipments in the Chautauqua-Erie belt of New York and Pennsylvania are also expected during early October. Possibly 4000 cars will be forwarded from that territory, not counting movement by truck or to juice factories. Quality is generally excellent. The Finger Lakes district and Hudson Valley of New York report good crops of grapes. Last year the entire state shipped 3050 carloads by rail or boat, and in 1926 about 7240 cars.

Grape growers and shippers, who do not have a copy of the special report on "Grapes in 1928," issued September 5 by the Bureau of Agricultural Economics, can obtain a copy on request to the Washington office of that bureau. This report outlines the crop and market prospects for 1928 grapes, and includes numerous statistical tables.

Pears Selling Well

Price advances for northwestern pears created considerable excitement a few weeks ago. The prediction of exceptionally heavy crops in California and Washington caused a feeling that low prices would prevail. Northwestern canners contracted most of their early supplies of No. 1 Bartletts at $30 a ton. But, before the season was far advanced, they were in the field, making hurried purchases and paying as high as $45, though the bulk of the canning crop was bought for $37.50 a ton. F.o.b. prices of shipping stock advanced in sympathy, and reached $2 a box at Medford, Ore. City market prices had touched top of $3.50 per box. The sharp rise for cannery pears was chiefly a result of the small size of Bartletts in California. Much of the California fruit was too small for processing; hence the general demand in the West for larger-sized pears for canning.

Western Colorado had a rather light pear crop this year. California shipments amounted to about 9000 cars by September 1 and had already exceeded last season's final total for that state. Movement from Washington and Oregon was 3300 cars by the early part of September, compared with 1300 the year before. Michigan expects more pears than in 1927, but New York not quite so heavy a crop as last season. A few cars of best Bartletts had been contracted at Michigan orchards for $1.40-$1.50 per bushel, some of this stock being intended for export trade. The f.o.b. price at shipping points was $2. Size of the fruit in Michigan is only medium. The first report from western New York points showed bushel baskets of Bartletts selling there around $1.90-$2.

Other Fruits

Peaches were jobbing in terminal markets at a wide range of $1.50-$2.50 per crate or bushel basket during the forepart of September, with shipments averaging 800 cars daily, as against 400 each day during the same period in 1927. Practically all of the increase over last year was in California and Washington. Colorado Elbertas in boxes averaged $1.25 in Kansas City. The Colorado crop was much below last season's volume. Dry weather reduced the size of peaches in Utah. Pennsylvania, New York and other eastern sections were becoming active and expected to find a favorable market.

As the fresh *prune* season waned in Washington and Oregon, the Boise district of Idaho was ready to start shipping. By early September, Oregon and Washington had forwarded 1600 cars —more than during all of last season —and some shipments were still to come. The Idaho crop was reported to be of fine color and high sugar content. Suitcase boxes in the Milton-Freewater district of Oregon were closing the season around 35 to 40 cents, f.o.b. usual terms.

Grapefruit has been coming in light volume from the Isle of Pines since August 1. The early crop there was estimated at 100,000 crates, but a large share is shipped to England. Last year's crop was light. The f.o.b. price this season is around $2.50 per crate, and the entire early crop probably will be moved from the island by mid-October—just before Florida grapefruit becomes heavy.

September Crop Reports

Apples—The total production of apples based upon the September 1 condition is indicated to be 178,949,000 bushels, which is practically the same as the August forecast. Last year the apple crop amounted to 123,455,000 bushels, and in 1926 the production was 246,524,000 bushels.

(*To Foot of Next Page*)

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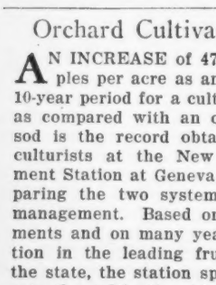

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Orchard Cultivation Pays

AN INCREASE of 47 barrels of apples per acre as an average for a 10-year period for a cultivated orchard as compared with an orchard left in sod is the record obtained by horticulturists at the New York Experiment Station at Geneva in a test comparing the two systems of orchard management. Based on these experiments and on many years of observation in the leading fruit sections of the state, the station specialists advocate the cultivation of most orchards during the summer, followed by the sowing of a cover crop in the early fall.

In the station tests, an average yield of 69 barrels per acre was secured for 10 years in an orchard which was left in sod. During the same period, a cultivated orchard produced on the average of 116 barrels. The trees in the cultivated orchard also showed greater vigor and made more growth than those in sod.

The beneficial effects of cultivation are believed to be due to the saving of the soil moisture and the lack of competition between the trees and the sod for moisture and plant food. Also, insect pests and diseases are very noticeably curtailed in cultivated orchards where less protection is afforded the insects and disease organisms than they find in sod.

It is pointed out, however, that where soils wash badly or on rocky land where cultivation would be difficult, tillage would be impractical. Also, the cost of cultivating an orchard is greater than keeping it in sod.

Fruit Farm Engineering

By E. W. LEHMANN

Electric Power for the Fruit Grower

POWER lines are being rapidly built through the farming areas of the country, providing electricity for the small towns and making it possible for many farmers to get 24-hour electric service without great expense. It should be kept in mind that many of the power lines carry such high voltages that farmers cannot get service directly from them. Of the 9000 miles of interconnected power lines in Illinois, only about 4000 miles have sufficiently low voltages so that farms can be served without providing an expensive sub-station. Such a sub-station was recently built in Calhoun county, Illinois, and power is being obtained from the high voltage lines extending across the country from Keokuk, Ia., to St. Louis, Mo. From this sub-station about 40 miles of line is being built between the small towns in the county, and a fine opportunity for electric service is afforded the fruit growers of that county.

It is not generally known that Calhoun county is one of the best, if not the best, apple producing counties in the country. One-third of all Illinois' commercial apples are produced in this county. It has been estimated that 500,000 barrels of apples would be shipped out of this county this season. The county is a narrow strip of land at the mouth of the Illinois River, between the Illinois and the Mississippi rivers. The power line extending through the county puts a large group of apple growers reasonably close to it.

During the first week in September I spent a few days in Calhoun county to determine the possible uses the apple growers could make of electricity. One use of vital importance to the grower is to operate a grader. The practice of apple grading generally followed at present is to sort the apples from a table right out in the orchard. However, packing sheds are being built and the use of mechanical graders is being extended. Some of the small graders are operated by a motor as small as one-fourth horsepower. The large graders require a motor of three or four horsepower. The size motor required is dependent on the length and number of conveyors to be operated, as well as the size of the grader. One of the graders seen in Calhoun county had a 40-foot 18-inch conveyor belt to take the apples into the grader. This length of belt made possible a lot of storage space for ungraded apples close to the machine. The electricity required for grading apples is very slight, requiring on an average of only about one kilowatt hour for each hundred bushels graded, at a cost of approximately five cents, depending on the rate charged.

In some parts of the country fruit washers are used to remove the spray residue before the fruit is packed. The Oregon Agricultural College at Corvallis, Ore., developed a washer with a capacity of about 50 bushels of apples an hour. This washer is operated by a one-half horsepower motor and uses only about one-third kilowatt hour of electricity for each

(*To Top of Next Page*)

Monthly Fruit Market Review

(*From Preceeding Page*)

The commercial apple crop is estimated at 33,122,000 barrels compared with 25,900,000 barrels last year and 39,119,000 barrels packed from the big crop of 1926. In the northeast and in Michigan prospects have continued to decline and the quality of the fruit in poorly sprayed orchards is being increasingly affected by apple scab. These states have relatively good crops of summer and fall apples but light crops of winter varieties. Baldwins are reported particularly light in both New York and Michigan; McIntosh apples are relatively scarce in both New England and New York. In Virginia and West Virginia there has recently been an abundance of moisture and fruit is sizing up better than expected. In the Northwest prospects have declined slightly because it is feared that the intense heat will prevent apples from reaching their usual size.

Peaches—The indicated 1928 peach crop declined about one per cent during August to 66,752,000 bushels. This is almost half again as large as the crop harvested in 1927 and about 3,000,000 bushels below the record 1926 crop.

Pears—The pear crop is estimated at 22,812,000 bushels, of which nearly two-thirds are being harvested on the Pacific Coast where the acreage is rapidly increasing.

Grapes—The greatest change in fruit prospects during August was the sharp reduction of 211,000 tons in the prospective California grape crop, which has resulted from the excessively hot weather combined with some shortage of water. Instead of a record California crop, the present indications are for a total of 2,327,000 tons. This is slightly less than the crop available for harvest last year, although more than the 2,264,000 tons of that crop actually picked. The present estimate of the quantity available for harvest includes 476,000 tons of juice grapes, the largest crop in 14 years, 465,000 tons of table varieties, which is more than were actually picked from the crop grown last year, and 1,386,000 tons of raisin grapes, of which a portion are being shipped as fresh grapes. The present raisin grape forecast is within 60,000 tons of last year's record crop.

The estimated production of other California fruit and nut crops includes 169,000 tons of apricots compared with 208,000 tons in 1927; 185,000 tons of prunes compared with 203,000 last year; 75,000 tons of plums compared with 57,000; 13,000 tons of almonds compared with 12,000, and 35,000 tons of walnuts compared with 48,500.

As a result of the storm in Florida prospects for citrus fruit are not as good as they were a month ago. California reports still indicate that excellent crops of oranges and lemons are expected. In Florida the number of trees is steadily increasing but the condition of both oranges and grapefruit is lower than a month ago and below average but still materially above last year.

hour operated. I found one power operated wiper in Calhoun county, on the farm of Frank Dirksmeyer. Mr. Dirksmeyer was quite enthusiastic about the value of a wiper for improving the appearance of his apples. He makes a high grade pack and gets a top price.

On some farms the cull apples are being converted into cider and high-grade vinegar. Electric motors are the most satisfactory type of power for operating cider presses.

Stationary spray plants are in use on approximately one-half the orchards in the famous Wenatchee and Yakima districts of the state of Washington. Owners of these stationary spray outfits claim that they save one-third to one-half the time required with portable equipment. I found only a part of one orchard in Calhoun county equipped with a system of piping for stationary spraying. Seven acres, on a very steep slope, where it would have been very difficult to drive with a portable sprayer, were equipped with a piping system with 17 hose connections, located so that all the trees could be easily reached with a 125-foot hose. Some of the advantages of the stationary spray outfits as stated by owners are: They save time, they can be used on steep, rough land, the orchard can be sprayed when the ground is soft, they do not pack the soil, one can spray at the right time, the fruit is not knocked off, there is no damage to the trees, there is less depreciation of equipment, a better quality of work can be done, and at less cost. In the orchards of the state of Washington a large per cent of the stationary spraying units are operated by electricity. A bulletin on stationary spraying has been published by the Washington Experiment Station, Pullman, Wash.

Other uses for electricity on the fruit farm include pumping water for spray purposes, for the stock, and for household use. Most small orchardists keep a few cows and some poultry as a side line. Electricity is the most desirable and most economical source of power available for operating the cream separator and milking machine. It is also being used to advantage in incubating and brooding chicks, as well as lighting the poultry house for winter egg production. By the use of a small feed grinder, a proper ration for the chickens and cows may be prepared from home-grown grain, at considerable saving.

Many fruit growers can well afford to get electric service for household use alone. It is the most satisfactory type of power available for lights, for household refrigeration, for operating the many minor appliances, and for operating a water system. Cooking with electricity is practical and not expensive.

The Engine That Knocks

WHEN an engine begins to knock, it is pretty good evidence that something should be done, and done quickly. I have heard the motors of old automobiles knock so that they sounded as if they would go to pieces, and sometimes they do. The result may be a broken crankshaft, a connecting rod through the walls of the crank case, or a bearing melted out. If the cause of the knock is known, proper precaution should be taken to avoid serious damage. If the cause of the knock is not known, it should be determined as soon as possible.

A knock in a motor may be due to any one of a number of causes; some are of no consequence as far as effect on the motor is concerned. The most common causes of a knock in a motor are: an advanced spark, carbon in the cylinder, too lean a mixture, mechanical condition of the motor, and missing.

If a motor is laboring under a load and the spark is set in an advanced position, a knock will most likely result. This is quite noticeable when you attempt to pull a long hill on high. If the knock is due to an advanced spark, it is eliminated by simply retarding the spark or slipping the transmission into second speed. Don't leave the spark in a retarded position because a retarded spark will cause the motor to get hot.

The carbon knock is probably the most common knock. The remedy is obvious. The deposit of soot or carbon should be removed. The real cause of the carbon knock is due to the hot particles of carbon igniting the fuel charge too quickly. This, in effect, is the same as an advanced spark. After the carbon has been removed the next step is to see that it does not form again. Carbon accumulation may be due to a rich fuel mixture, too much oil or poor mechanical condition of the motor, leaky valves, etc.

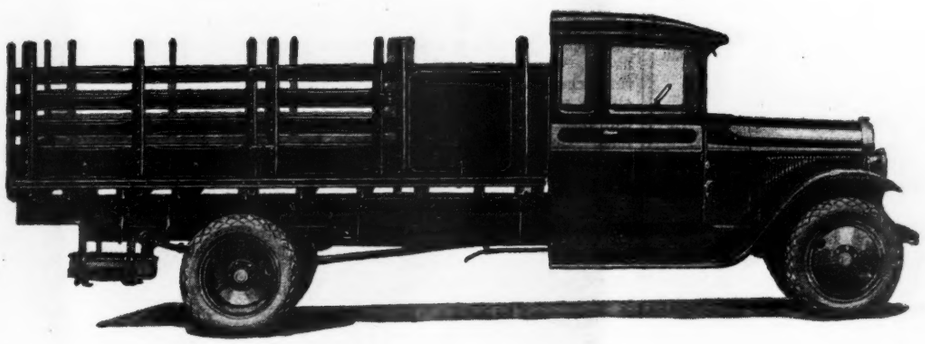
Knocks due to poor mechanical condition of the motor are the ones more likely to result in damage and they should have immediate attention. A worn bearing may knock slightly at first and the knocking may gradually increase. This is a rather common mechanical knock and is often neglected without serious damage resulting. A tight bearing is liable to cause more trouble. Under such conditions the knocking is not gradual but usually occurs rather suddenly and may result in serious damage to the motor if it is not stopped at once.

A loose piston will also knock or slap as it is sometimes called. Tight pistons may cause a knock in a new motor. Care must be observed in working a tight new motor in to reduce the possibility of damage.

Some other mechanical difficulties which would result in a noisy motor are a loose fly wheel and worn timing gears.

AND NOW A 3 TON TRUCK AT $1745

[CHASSIS F. O. B. DETROIT —135 INCH WHEELBASE]



PRICES

MERCHANTS EXPRESS —110" wheelbase	$ 665
COMMERCIAL TRUCK —120" wheelbase	775
1½-TON—130" wheelbase	995
1½-TON—140" wheelbase	1065
1¾-TON—150" wheelbase	1345
1¾-TON—165" wheelbase	1415
2½-TON—150" wheelbase	1595
2½-TON—165" wheelbase	1665
3-TON—135 wheelbase	1745
3-TON—165" wheelbase	1775
3-TON—185" wheelbase	1845

Chassis f. o. b. Detroit

THREE fast, powerful, rugged 3-Ton Trucks are now part of the famous line of Graham Brothers Trucks, built by Dodge Brothers.

Three wheelbases—135 inch at $1745 for dump or trailer work; 165 inch at $1775 and 185 inch at $1845.

Note the list of capacities in the complete line . . . . The right truck for any job.

Read the prices . . . . low on any basis of comparison . . . . *lowest*, if you consider the work they will do and the money they will make for you.

All sixes . . . . All with 4-wheel brakes—Lockheed hydraulic on the heavier types . . . . 4 speed transmissions in all 1¼, 1¾, 2½ and 3-Ton Trucks.

GRAHAM BROTHERS TRUCKS

BUILT BY TRUCK DIVISION OF DODGE BROTHERS

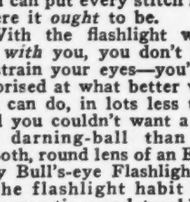
SOLD AND SERVICED BY DODGE BROTHERS DEALERS EVERYWHERE

Taking "Darn!" out of darning

. . . an Eveready Bull's-eye Flashlight does that. Makes this tedious routine-duty twice as easy. Just slip a lighted Eveready into a sock or stocking and see how easy darning becomes with light *inside*. You can put every stitch right where it *ought* to be.

With the flashlight working *with* you, you don't have to strain your eyes—you'll be surprised at what better work you can do, in lots less time. And you couldn't want a better darning-ball than the smooth, round lens of an Eveready Bull's-eye Flashlight.

The flashlight habit will save you time and trouble in a hundred other ways. Keep Eveready Flashlights handy around the house for unfailing convenience and safety. And keep them full of ready light and long-lasting usefulness by always using genuine Eveready Batteries.



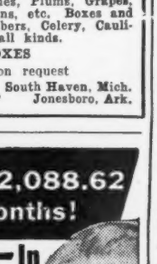
Baskets for Apples, Peaches, Plums, Grapes, Tomatoes, Cucumbers, Beans, etc. Boxes and Crates for Berries, Cucumbers, Celery, Cauliflower and vegetables of all kinds.

PLANT BOXES

Catalog mailed on request

The Pierce-Williams Co. South Haven, Mich. Jonesboro, Ark.

He Made $2,088.62 Sales In 2 Months!



So Can You—In Your Spare Time!

I. G. W. BUCK, Randall Co., TEXAS, now over 60 years old, has been a successful Stark Tree Salesman ever since 1898. Last Summer, between July 6 and Aug. 27, he sold $2,088.62 worth of Stark Fruit Trees—just in his spare time—in only fair territory.

I. G. W. BUCK Texas

Thousands of Farmers and Small Town Men Doing As Well!

Write us for PROOF! Let us show you the great Sales Opportunities that our Great Advertising Campaign—reaching 18,000,000 farms and homes—places within your grasp. Get terms QUICK—you are PAID WEEKLY—the work is healthful, pleasant and PROFITABLE. Don't let your neighbor beat you to this MONEY-MAKING OPPORTUNITY.

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Stark Bro's Nurseries

At LOUISIANA, MO. 111 Years

YOUR Opportunity COUPON! Use It TODAY

STARK NURSERIES, Box S.W.189 Louisiana, Mo. A. F. G. 10-28

Send me—without any obligation on my part—complete facts and terms of your Salesmen's Offer.

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CHATS with the Fruit Grower's Wife

By HAZEL BURSELL

"WELL BEGUN is half done," is never truer than when said of the school child's day. Up in time to dress unhurriedly and to eat a good, satisfying breakfast and get to school on time, means that the school day will be a good one. Many parents do not realize the tremendous nerve strain imposed on the little folk during the first few days of school, and, for that matter, throughout the school year. Youngsters may actually suffer for lack of the right kind of food, eaten as it should be, and for the lack of enough rest.

Dangers Incurred

It is common knowledge that the so-called dull or stupid child is often merely an under-nourished or improperly fed child. This has been proved again and again by experiments with large groups of children. Then, too, many of the naughty and incorrigible children are merely youngsters made restless by improper food and lack of sleep. No father or mother wants the child to be either stupid or incorrigible, so it behooves parents to see that John or Mary is properly nourished and rested.

Fruit, cereal, milk and toast, with the occasional addition of egg or crisp bacon, form the ideal breakfast for the school child of any age. Fruit, either cooked or fresh, should form the first course for the daily breakfast. Sometimes this fruit may be combined with the cereal for variety. Cereal every day is an absolute necessity, with cooked rather than commercially prepared cereals being given an overwhelming preference by dietitians. Toast and milk fill out the requirements. If this does not seem ample, a poached, soft-boiled or coddled egg may be added. An egg would be especially desirable if the cereal is one of the lighter prepared ones.

Hot breads have scant place in properly planned school breakfasts, even for older children. They are slower of digestion, apt to be filled with melted butter and so should not be given. (Of course, a little indulgence on rare occasions will do no particular harm, except to future discipline.) Crisp, dry toast, lightly buttered, is every bit as delicious, and much better for the youngster. The child should never under any circumstances be allowed to discard the crust of bread or toast, and any such tendency should be stopped the first time it is noted. Chewing on bread crusts insures proper tooth and jaw development.

School Lunches a Special Problem

School lunches, where they must be carried day after day, form a special problem. The ideal lunch would include some form of simple sandwich, preferably of whole wheat bread, a serving of some moist food in a tightly lidded container (such as a buttered or creamed vegetable which may be heated before being eaten), an apple, pear or orange, together with a cookie for dessert, and at least a half-pint bottle of milk. The lunch problem would be much simplified if the school board or teacher arranged to have a suitable hot dish prepared each day for all the school children. Then only simple sandwiches, fruit, milk and dessert would be needed. The fruit, which may be either fresh or cooked, would usually form part of the dessert.

The packing of the child's lunch is important. Each item should be neatly wrapped in waxed paper and packed in the lunch-box carefully to prevent mixing of flavors or destroying the shape. The heaviest items should be placed in the bottom. The lunch box itself should be easily sterilized and should have some means of continuous ventilation. A box fitted with thermos bottle and spoons would be a convenience.

Encourage Slow Eating

The child should be encouraged to eat his meals leisurely, whether it is lunch, breakfast or dinner. By so doing he will insure proper digestion of his food and therefore bodily and mental comfort so that he may do his work properly and efficiently.

Dinner may be the heaviest of the three meals, but it need not be a rich meal. Two vegetables besides potatoes (one may be raw, in salad form), some broiled or baked meat, a custard or fruit dessert with bread and butter and milk will supply adequate fuel for the body and at the same time provide for the rebuilding of the tissues worn out by the day's work. Dinner should be served to the little folks as early as possible so that they will have some time for their "dinners to settle" before going to bed.

About the after-school "bite," most authorities agree that if the child is really hungry he should be given one slice of bread and butter or a cracker and a glass of milk to sustain him till dinner time, so that he may not be too ravenously hungry and bolt his food later. However, anything sweet at this time is absolutely taboo, as it will destroy the dinner appetite, with the result that the necessary vegetables, etc., will be slighted.

Good Rest Important

Then comes rest. Twelve hours each night is not too much sleep for the young child. Seven-thirty to seven-thirty will give time for school and play and meals, and at the same time provide adequate rest. The amount of sleep required decreases with the increasing age of the child, but the minimum for school children is eight hours of unbroken sleep.

Regularity is very important for the health and general well-being of any child. The early formation of good habits of sleeping, eating and studying eliminates most of the problems of discipline, thereby making for the utmost happiness for parents, teachers and children. Habits, both good and bad, are formed by repetition and regularity; therefore it devolves upon parents to see that a regular schedule with few variations is carried out daily while the child is young. The variations will come soon enough. Teach them good habits first.

Don't Iron Lace

The careful and efficient housewife never attempts to iron lace, other than narrow edgings on garments, etc. The proper method of smoothing lace is to stretch it to the original shape and pin to a padded board in exactly that shape, pinning down each of the points carefully. When an iron is used, there is danger of tearing the lace.

THE RIGHT TOOL SAVES TIME

Takes Out The TOUGH ONES

Clean up the fence rows and corners with this heavy, keen mattock. Extra sturdy construction for chopping in hard ground or cleaning out tough old roots. Blade and shank forged from solid steel, oil tempered and sharpened.

The brand True Temper is burned in the handle to mark each hoe as the best tool of its kind that can be made.

THE AMERICAN FORK & HOE CO.
General Offices:
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Makers of Farm and Garden Tools for over 100 years.

Users' Catalog. **Free on request.** Describes over 400 choice tools for every farm task.

If your dealer has not yet stocked the True Temper Solid Steel Mattock Hoe, Cat No. DE3H send us his name and **$1.45** and we will ship you direct, postpaid.

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Brown's Beach Jacket

They have found the jacket "so entirely satisfactory and comfortably warm" that they experience real pleasure in wearing it in the Arctic regions. Just the cold prevention for the outdoor man. Made of strong, windproof knit cloth with knit-in wool fleece lining, and is cut to fit snugly without binding. Three styles—coat with or without collar, and vest.

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BROWN'S BEACH JACKET COMPANY
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OTTAWA LOG SAW

Make Money! Wood is valuable. Saw 15 to 20 cords a day. Does more than 10 men. Ottawa easily operated by man or boy. Fells trees—saws limbs. Use 4-hp. engine for other work. **30 DAYS TRIAL.** Write today for **FREE** book. Shipped from factory or nearest of 10 branch houses.

OTTAWA MFG. CO., 1351-W Wood Street, Ottawa, Kansas

Read the advertisements—those guide-posts to better things

Fruit Farm Poultry

By RALSTON R. HANNAS

Packing Market Eggs for Shipment

CONSIDERABLE loss in shipping eggs that occurs through breakage can be avoided if care is given in packing them. One of the first considerations is the case itself. If it is impossible to obtain a new case, a second hand one may do if it is properly renailed and strengthened. The first step, then, is to renail the cases and make them as strong as possible.

In packing the eggs, the following method is usually employed, as this kind of a pack stands up under shipment. A regular fiber flat is placed in the bottom of the case, then a fiber or strawboard filler which is filled with eggs, then a flat and a filler, and so on until the top layer of the case is reached. Between the top layer and the next to the top layer an excelsior pad is placed, on top of this the filler containing the eggs, then another excelsior pad on top of this. The same procedure is followed in the other half of the case.

Some poultrymen place a pad across the board partition in the middle of the case before nailing on the lid.

Has It Been a Profitable Year?

THE last of October is usually considered the end of the poultryman's year, for on the first of November he generally has his pullets housed and everything in readiness for the coming year. He starts all his records on November first. Now is a good time, therefore, to look back over the past year and see if it has been profitable in all respects; if there are some branches that are more profitable than others; if methods of management have been as efficient as desired; if it is possible to correct conditions so the next year will be a better one.

The Connecticut college asks some questions on its poultry calendar that might very well be considered by poultry keepers at this time. Some of them are:

"Has some one department of your business paid a good profit and another department paid no profit?

"Has low egg production kept down your receipts?

"Is your overhead too high for the volume of business done?

"Would greater diversity within your poultry business increase your profits?"

We might also add, "Do you know how much it costs you to produce a dozen eggs?"

Questions of this kind can be answered if careful and complete records have been kept for the past year. If no records have been kept, now is a good time to get a simple and complete system of records ready for next year, so a check up can be made at the end of a definite period that will result in placing the poultry flock on a more profitable basis.

Fall Care of the Males

AT THIS time of the year, the poultry keeper's attention usually centers around his maturing pullets, and he is apt to give his breeding males scant attention. On most farms the males are not needed in the flocks for breeding until December or January, and they are often allowed to look out for themselves.

It is important that these males receive some consideration now, however, in the way of comfortable housing. A large number should not be crowded together in a small house, neither should males be allowed to roost out on range these cool nights. If cockerels are taken in off range now before damp, cold weather comes, there will be less chance of contracting colds, roup and canker. If such diseases attack the males now, there is the possibility that they will hang on through the winter and make the birds unfit for breeding.

Put them in a comfortable house where they can have a run, if it is desired to let them run, putting about 40 in a 10 by 12 foot house. When the males are being taken in off the range is a good time to cull out any that for any reason should not be placed in the pen of breeders later on. Dispose of such birds now rather than stand the expense of feeding them and using room to house them that might otherwise be put to better use.

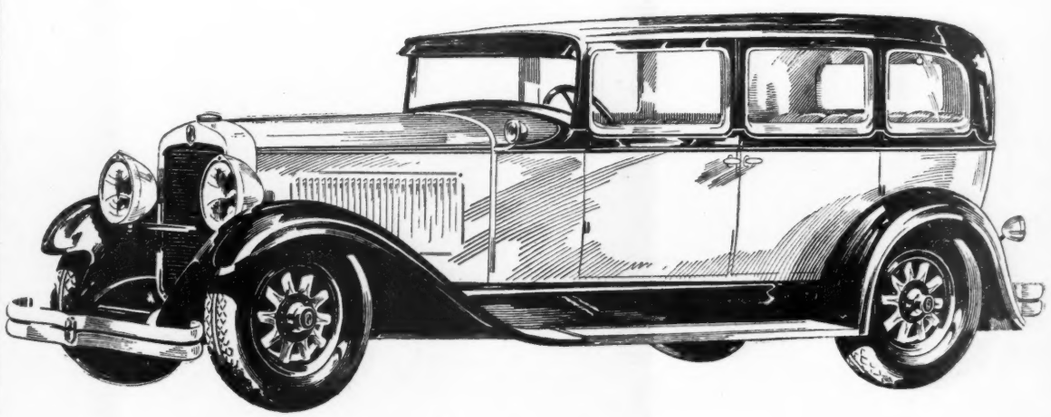
A Whitewash Formula

A GOOD whitewash formula for use in a poultry house is that recommended by the Kansas Experiment Station. It is composed of one and one-half pecks of hydrated lime; salt, two pounds; commercial lime-sulphur dip, four gallons; water, 40 gallons. If it is desired to make smaller quantities of the whitewash, the following proportions can be used: Hydrated lime, one heaping quart; salt, three tablespoonfuls; commercial lime-sulphur, one and one-half quarts; water, four gallons.

To make it adhere more readily, alum may be added at the rate of one ounce to the gallon, and if it is desired to give the wash a gloss like paint, a bar of cheap soap can be dissolved in a gallon of water. To this is then added about five gallons of boiling water, and this in turn is added to about five gallons of thick whitewash.

NASH "400"

THE WORLD HAS A NEW AND FINER MOTOR CAR



TWIN IGNITION MOTOR

Greater Power -- Greater Speed -- Greater Economy

PEOPLE who already have driven the new Twin-Ignition-motored Nash "400" have instantly realized its superiority in performance to cars with older types of motors.

In this new car, they discover more power and speed than they ever will care to use. They find a real thrill in the snap of Twin-Ignition traffic getaway.

Has Nash accomplished these remarkable results by building a larger motor—one with an enormous appetite for gasoline? Or by building a high-compression motor that needs special, high-priced fuels?

The answer to both questions is, "No". Nash has developed new principles of high-compression motor construction which create more power, more speed, with *ordinary* gasoline, *and less of it!*

Today, the Twin-Ignition, 12-spark-plug, high-compression motor powers all Nash "400" Advanced and Special Six Models. Its results are so remarkable as to clearly point the way to the future improvement of other cars.

Your Nash dealer will explain Twin Ignition to you and let you drive a Twin-Ignition-motored Nash "400", *anytime.*

(8603)

Buyers' Service Bureau

For the convenience of our readers we list below some lines of fruit farm equipment and home conveniences. If you are considering the purchase of any of these items we will be glad to forward your request for information to responsible manufacturers. From them you will receive full information as to prices, etc.

FOR THE HARVEST
- ☐ Ladders ☐ Fruit Pickers
- ☐ Picking Sacks
- ☐ Orchard Pick-up Wagons
- ☐ Berry Crates and Fillers
- ☐ Box and Shook Stock
- ☐ Bushel Baskets
- ☐ Tub-shape Baskets
- ☐ Less-than-bu. Baskets
- ☐ Fiber Fruit Packages
- ☐ Package Labels
- ☐ Canning Equipment
- ☐ Fruit Dryers or Dehydrators
- ☐ Fruit Pitters ☐ Peelers
- ☐ Corers ☐ Slicers
- ☐ Grading Machinery
- ☐ Fruit Cleaners
- ☐ Fruit Presses
- ☐ Cider Presses
- ☐ Pasteurizing Outfits
- ☐ Barrel Facers
- ☐ Basket Facers
- ☐ Barrel Presses
- ☐ Box Presses
- ☐ Liners and Cushions
- ☐ Stencils
- ☐ Wax Paper

ELECTRICAL
- ☐ Wiring and Lighting Supplies
- ☐ Electrical Refrigeration
- ☐ Vacuum Cleaner
- ☐ Kitchen Motor
- ☐ Sewing Machine Motor
- ☐ Separator Motor
- ☐ Electric Fans
- ☐ Floor Lamps
- ☐ Electric Milker
- ☐ Electric Water Pumps
- ☐ Electric Iron ☐ Grills
- ☐ Heaters ☐ Vibrators

PAINTS, OILS, ETC.
- ☐ Inside Paint ☐ Barn Paint
- ☐ Furniture Stains and Enamels
- ☐ Auto Enamels
- ☐ Enamel Polish
- ☐ House Paint
- ☐ Wall Paper
- ☐ Cold Water Wall Finishes
- ☐ Roofing Paint
- ☐ Roofing Cement
- ☐ Lubricating Oil
- ☐ Cup Grease
- ☐ Belt Dressing
- ☐ Transmission Grease

STOVES AND RANGES
- ☐ Gas Range
- ☐ Gasoline Range
- ☐ Electric Range
- ☐ Coal Range
- ☐ Electric Hot Plate
- ☐ Electric Grill
- ☐ Blue Flame Kerosene Range
- ☐ Base Burner
- ☐ Coal Heater
- ☐ Wood Burning Heater

MISCELLANEOUS CONTROL EQUIPMENT
- ☐ Codling Moth Bands
- ☐ Fumigants for Root Insects
- ☐ Sticky Preparations

CLOTHING
- ☐ Ladies' and Children's Clothing
- ☐ Aprons
- ☐ Men's Clothing
- ☐ Overalls
- ☐ Rayons and Silks
- ☐ Woolens
- ☐ Cotton Fabrics
- ☐ Linens

NURSERY STOCK
- ☐ Plants
- ☐ Trees
- ☐ Small Fruit Plants
- ☐ Strawberry Plants
- ☐ Ornamentals
- ☐ Perennials

SEEDS
- ☐ Garden ☐ Field
- ☐ Flower ☐ Bulbs
- ☐ For Cover Crops
- ☐ Seed Potatoes

FERTILIZERS
- ☐ Nitrogen Fertilizers
- ☐ Phosphates
- ☐ Potash Salts
- ☐ Mixed Mineral Fertilizers
- ☐ Animal Manures
- ☐ Agricultural Lime
- ☐ Gypsum (Landplaster)

TILLAGE TOOLS
- ☐ Single Walking, 2-horse
- ☐ Single Walking, 1-horse
- ☐ Single Riding
- ☐ Riding Gang
- ☐ Disk Plows
- ☐ Horse Harrow
- ☐ Tractor Tillage Tools
- ☐ Horse Cultivators
- ☐ Hand Cultivators
- ☐ Grape Hoe
- ☐ Spiketooth Drag
- ☐ Springtooth Drag
- ☐ Subsoiler, Horse
- ☐ Subsoiler, Tractor
- ☐ Rakes ☐ Hoes
- ☐ Scuffle Hoe

TRACTORS
- ☐ Vineyard or Garden
- ☐ Orchard

TRUCKS
- ☐ Light Delivery
- ☐ Medium ☐ Fast
- ☐ Heavy Hauling
- ☐ Chassis

BUILDING
- ☐ Ready Cut Buildings
- ☐ House Plans ☐ Barn Plans
- ☐ Fruit Storage House Plans
- ☐ Lumber ☐ Millwork
- ☐ Insulation Materials
- ☐ Builders' Hardware
- ☐ Roofing ☐ Steel Siding
- ☐ Plaster ☐ Stucco

FOR THE HOUSE
- ☐ Plumbing Supplies
- ☐ Bathroom Fixtures
- ☐ Warm Air Furnace
- ☐ Hot Water Heating System
- ☐ Steam Heating System
- ☐ Oil Burners
- ☐ Carbide Gas System
- ☐ Farm Electric Plant
- ☐ Gasoline Lamps
- ☐ Pressure Water System
- ☐ Gravity Water System

SPRAYING EQUIPMENT
- ☐ Power Spray Rig
- ☐ Horse Traction Rig
- ☐ Cart Rig, Hand Pump
- ☐ Barrel Outfit
- ☐ Compressed Air Sprayer
- ☐ Hand Spray Pump
- ☐ Power Spray Pump
- ☐ Spray Rig Tank
- ☐ Water Supply Tank
- ☐ Supply Tank Tower
- ☐ Pipe and Fittings
- ☐ Pressure Spray Hose
- ☐ Spray Nozzles
- ☐ Spray Rods ☐ Spray Guns
- ☐ Spray and Dust Masks

AUTO ACCESSORIES
- ☐ Tires ☐ Batteries
- ☐ Spark Plugs ☐ Gas Savers
- ☐ Delivery Bodies
- ☐ Auto Washers

FARM TOOLS, ETC.
- ☐ Gasoline Engines
- ☐ Kerosene Engines
- ☐ Carpenter Tools
- ☐ Machinists' Tools
- ☐ Pipe Fitting Tools
- ☐ Masons' Tools
- ☐ Plasterers' Tools
- ☐ Lathes
- ☐ Buzz Saw Outfit
- ☐ Stump Pullers
- ☐ Fencing Tools
- ☐ Post Hole Diggers
- ☐ Shovels ☐ Picks ☐ Axes
- ☐ Electrical Wiring Tools

HOUSEHOLD CONVENIENCES
- ☐ Power Washing Machine
- ☐ Power Mangle
- ☐ Clothes Dryer
- ☐ Dish Washer
- ☐ Sewing Machine
- ☐ Phonograph
- ☐ Radio ☐ Ladders
- ☐ Sweepers and Cleaners
- ☐ Gasoline Irons

DUSTING EQUIPMENT
- ☐ Power Dusters
- ☐ Power Mixer and Duster
- ☐ Traction Cart Duster
- ☐ Hand Power Duster
- ☐ Knapsack Duster

SPRAY MATERIALS
- ☐ Miscible Oil
- ☐ Fish-Oil Soap
- ☐ Dry Lime-Sulphur
- ☐ Liquid Lime-Sulphur
- ☐ Bordeaux Mixture
- ☐ Copper Sulphate
- ☐ Hydrated Lime
- ☐ White Arsenic
- ☐ Arsenate of Lead
- ☐ Colloidal Sulphur Sprays
- ☐ Sulphur-Lead Sprays
- ☐ Summer Oil
- ☐ Contact Sprays for Sucking Insects
- ☐ Combination Insecticide and Fungicide

MISCELLANEOUS ORCHARD EQUIPMENT
- ☐ Orchard Heaters
- ☐ Orchard Thermostats
- ☐ Thermometers
- ☐ Microscopes
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Breeding New Fruit Varieties

(Continued from Page 6)

splendid tree and fruit characters and is as resistant as any other pear to blight. Probably no other fruit is as capricious to soils, climates, and pests as the pear, and these new kinds ought to be well tried out before anyone plants them on a large scale.

Cayuga is a Seckel seedling having splendid tree characters and in the trial orchard was very resistant to blight. The pears are as large as those of Bartlett, but have the season and shape of Seckel and the color of Clairgeau. The flesh is firm and fine in texture and has the delectable flavor of Seckel.

Gorham is another sort resistant to blight, which ripens its fruit a month later than Bartlett. The fruits resemble those of Bartlett in size, shape and color. The flavor is sweet and vinous with a very marked and pleasing aroma. It is one of the best flavored pears of its season and has been reported upon very favorably in several regions. It seems to do especially well in California. The trees are vigorous and productive.

Phelps is a cross between Winter Nelis and Russet Bartlett. The fruit is the type of Bartlett but ripens about Thanksgiving time and keeps until Christmas. The flavor is better than that of Bartlett but the fruit is not so bright in color.

Pulteney is a sister plant to Phelps with fruit of the Bartlett type. It ripens four weeks later than Bartlett and is in season until Phelps starts to mature. The chief fault of the variety is the dull color of the fruits. This fault may not appear in climates and soils better adapted to pear growing than those at this station.

Plums

Plum culture is on the wane in every part of the United States. This is largely the fault of plum growers, since for years they have filled the markets with varieties such as Lombard and Bradshaw, which are not appetizing to eat out of hand and are none too good for culinary use. The aim in plum breeding at this station has been to produce a large, handsome plum, better in quality than any of the standard sorts now grown. Two new varieties seem to meet these requirements.

Hall is a cross between Golden Drop and Grand Duke, two of the largest and handsomest of the European plums, but both poor in quality. Hall is choicely good in all flesh and flavor characters. It resembles Grand Duke in size, shape and color. The tree is hardy, healthy, vigorous and productive. The fruits are handsome and well colored and should sell in any market.

Stanley is a cross between Golden and Grand Duke. It bears fruits excellent in cooked products and to eat out of hand. The tree of Stanley can hardly be improved upon. The fruits are large, prune-shaped, dark blue with a thick bloom, of sweet, pleasing flavor. It ripens a few days after Grand Duke.

American Mirabelle is a small, sweet yellow plum, not larger than a Damson, to which it is related in tree characters but not in fruit characters. The flavor of this little Mirabelle is delightfully good, and the new variety should be appreciated by all lovers of choicely good fruits.

Grapes

Most of the men who have undertaken to improve American grapes have sought to obtain a combination

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25 1-year PEACH TREES $4.50 7-16 to 9-16 in.; 3-5 ft.; (50 for $8.50) (100 for $15.00) f. o. b. Neosho. Your choice of Belle of Georgia, Elberta, J. H. Hale.

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of the fruit characters of the European grapes with the vine characters of the American grapes. Twenty thousand hybrid grapes have been grown on the grounds of this station with this end in view. Seventeen varieties have been named, out of which three are pre-eminently good. It is not too much to say that these three surpass any other grapes of their color and season.

Ontario is a cross between Winchell and Diamond. It ripens a little before Winchell, hitherto the best early green grape. Bunches and berries are larger and more pleasing in appearance than those of either of these parents, and the vines are more vigorous and more productive. The grapes hang to the vines long after ripening. This is an ideal early green grape.

Portland ripens at about the same time as Ontario, and while the fruits are not quite so good as those of Ontario, the vine characters are even better, so that Portland ought to take first place among early green grapes as a market variety. The vine is particularly vigorous, hardy, productive, and healthy. Bunches and berries are larger than those of any other early green grape.

Sheridan is the most promising grape that the station has sent out. Without a question, at this station it surpasses Concord, with which it must compete. Those who have tested it in other grape regions report the same. The plants are just as vigorous, healthy, hardy, bear regularly, and are even more productive. The bunches of Sheridan are larger and more compact, and the berries are as large and have a sweeter, richer flavor. The season is a week later than that of Concord, and the grapes do not shell as readily, so that the grape can be kept much longer. It only remains to be seen whether or not Sheridan will thrive in all eastern grape regions as Concord does.

Raspberries

Unless varieties of raspberries resistant to mosaic and other diseases can be bred, the production of raspberries will cease to be profitable in any part of the United States. This station for several years has been trying to breed varieties of these fruits resistant to several diseases. A half dozen red sorts have been sent out and are being much grown, but none is up to the mark in resistance to mosaic. Several promising seedlings are now under second test which seem to be resistant to mosaic but it is too early to speak of these. Meanwhile, two good purple sorts and one black sort seem to surpass any others of their kinds.

Brant is a new sort far superior to any other purple in both plant and fruit characters. The plants are highly resistant to raspberry diseases, and the fruits are large, handsome, firm, ship well and are of the very best quality.

Webster is another purple sort, the plants of which are very productive and nearly free from mosaic. They are medium in size, vigorous and upright. The berries are large, dull purple, and of good quality. Brant and Webster ought rapidly to take the place of Shaeffer and Columbian.

Dundee is a very promising blackcap with fruits of large size and excellent quality. The plants are tall, vigorous and very productive. The variety is a midseason sort and all in all surpasses any other blackcap grown on the station grounds.

Strawberries

This station has bred and distributed 15 strawberries, but three of which seem now to be generally grown. These three give a succession of strawberries from earliest to latest.

Beacon is one of the best early strawberries, failing, if at all, in being a little susceptible to strawberry diseases. The fruits are the handsomest of any early strawberry and hold up well throughout their season in spite of drought or other adverse conditions. The quality is excellent. The plants are handsome, healthy and productive, and bear their crop on long pedicles, which makes picking easy. The flowers are perfect.

Boquet is a midseason sort, the fruits of which are characterized by large size, bright color and flesh which colors to the center. The flavor is sweet and rich. The berries ship excellently and keep well. The plants are vigorous, productive, healthy and produce an unusually large number of big, handsome berries. The flowers are perfect.

Bliss is a late strawberry with large, handsome, bright red fruits, the flesh of which is well colored to the center and has a pleasant commingling of richness, sweetness and sprightliness which make it among the best in flavor. The plants equal those of any commercial variety of the same season, and surpass all those on the station grounds in ability to withstand drought, so that there are few small berries when the soil is dry and parched. The flowers are perfect.

Wenatchee Association to Can Cull Apples

THE Wenatchee District Co-operative Association, Wenatchee, Wash., is arranging to can cull apples for its members. In order to handle this business to the best advantage a special contract has been drawn up as a supplement to the regular membership agreement. By signing this contract the member advises the association whether he wishes to pool his cull apples this season or not. The contract also covers the 1929 crop but contains a withdrawal clause. Growers are warned that they cannot make any money selling small sizes and should keep such apples at home. A limited quantity of Bartlett pears will also be canned.

Seventh Mid-West Horticultural Exposition

THE SEVENTH Mid-west Horticultural Exposition is to be held at Cedar Rapids, Ia., November 14-17 inclusive, in the new million dollar Memorial Building. Cash premiums to the amount of $7,000 will be awarded for the various exhibits. The amount offered in the fruit department will be over $2,000. Growers from the 17 middle western states are invited to make exhibits.

Premiums for exhibits on edible nuts, flowers, vegetables, honey and home-canned products, will also be offered. Anyone interested in securing a premium list should write to R. S. Herrick, secretary, Iowa State Horticultural Society, State House, Des Moines, Ia.

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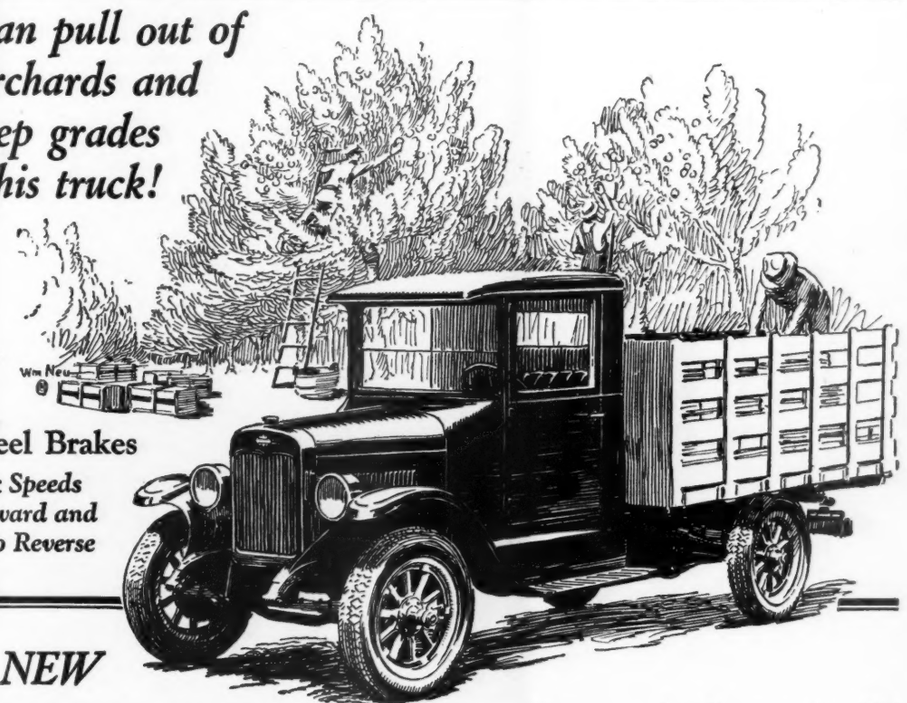

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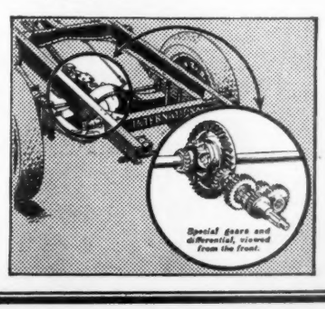

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"Soggy Breakdown" a Storage Disorder

(*Continued from page 4*)

at 30 and 32 degrees Fahrenheit, but more severely at 30 than at 32 degrees. Again, at 36 degrees and in common storage, it made no appearance or was of no significance. In 1926, two different air-cooled storage houses were used with the same result.

The disease can be best described from its characteristics as it occurs on Grimes and Wealthy. It has not occurred on Jonathan, Northwestern Greening, Arkansas (Mammoth Black Twig) or Willow Twig. At the present time we have a number of other important commercial varieties in our tests. The disease develops as soft brown tissue in the flesh of the apple, in the portion known as the cortex. This part of the apple is just outside of the ring formed by the 10 main vascular bundles. A zone of brown tissue gradually appears when apples become affected (Figure 2). In most cases there is no external browning or softening, so that the disease can only be detected by pressing firmly on the fruit. If the apple is severely affected, it easily yields to the pressure of the hands and caves in at the place where pressure is applied. When first removed from storage, the affected tissue is somewhat firm, tough and rather juicy. Because of its sogginess and moist consistency, the writers have called the disease "soggy breakdown." We have used this term in order to discriminate from "old age decay," which is characteristic when ripening has progressed to the extreme and when the fruit becomes mealy. Old age decay or internal breakdown may better be called "mealy breakdown." (See Figures 3 and 4.) Full descriptions of these two types of breakdown are given in Research Bulletin No. 115 recently published by the Iowa Agricultural Experiment Station.

Behavior of Soggy Breakdown

Aside from low temperature as being the primary cause, it was found that other factors greatly influence the development of soggy breakdown. One of these is earliness or lateness in picking. Another is the amount of delay intervening between picking and storing. As a general rule, it has been found that soggy breakdown increases as the period of delay before storing is lengthened. It was found that when fruit was stored immediately or a day after it was picked, little or no breakdown occurred. This held true when the fruit was picked at the beginning of the harvest period. However, when picking had been delayed until the fruit was slightly overmature, a considerable amount of soggy breakdown occurred even on the fruit which was stored immediately, but of course only at the lower range of temperature (30 to 32 degrees). The apples which are most susceptible to the low temperature breakdown are those which have reached a certain degree of maturity, that is, a point where the ripening processes have continued up to a certain level. When this level has been reached and the fruit is suddenly placed in a room where the temperature is from 30 to 32 degrees, it becomes very susceptible to soggy breakdown. There is also evidence to show that when ripening has proceeded slightly beyond this level of maturity the apples are no longer susceptible to the disease.

Time of Occurrence of Soggy Breakdown

Soggy breakdown on Grimes begins to appear about the second week in December. The exact time of its initial appearance is dependent upon the extent of ripening which takes place previous to storage at low temperatures. The disease occurs earlier and more severely at 30 than 32 degrees. It has been observed to a certain extent at 34 degrees, but was only of significance on fruit which had been delayed three weeks at the orchard. The seriousness of the disease is increased as the storage season is prolonged. Soggy breakdown was two to three times as severe on January 11 as it was just a month earlier, for the storage season 1925-26. In February of the same season, it had increased from two to three times as much as it had been in January. Apples have been kept repeatedly until the middle of May at 36 degrees and in common storage, without the occurrence of soggy breakdown, when comparable lots had become seriously affected by December 20 at 30 and 32 degrees.

Whether or not the prevalence of soggy breakdown varies according to seasonal conditions, has been noted in the experiments. Practically the same amount of the disease occurred in 1925 as in 1924. In 1926 soggy breakdown was only about one-half as abundant as it was in the other two seasons. Weather bureau records were consulted for the three seasons. However, the lower amount of breakdown noted in 1926 could not be accounted for on the basis that there were differences in the total seasonal rainfall or mean temperatures for the growing seasons. It is believed that if the fruit could be handled under exactly the same conditions each season, the disease would be present in about the same proportion each year.

Susceptibility of Apples from Different Localities

The question arises as to whether the fruit used in these experiments was for some reason peculiarly subject to this type of breakdown because of local conditions. An experiment carried out in 1926 gave some light on this point. Some Grimes were obtained from the Wenatchee district, from the State Experimental Orchard at Grand Rapids, Mich., and from two different sections in Iowa. The Grimes from Wenatchee and Grand Rapids were shipped to Ames immediately after picking. They were then placed under similar treatments in the various storage rooms, along with Grimes grown at Ames and at Mitchellville, Ia.

Limited space will not permit us to go into the details of the entire experiment, but the result in the main can be given. The apples from all four localities showed severe soggy breakdown development in December, but only at the lower temperature range, as in previous experiments. In all cases, the Grimes kept favorably at 36 degrees Fahrenheit, while the contrasts between the lots stored at 30 and 36 degrees were more striking than ever. It appears then that the disease is not necessarily confined to one locality.

Is a Change in Cold Storage Temperatures Desirable?

From the results of the above experiments, it is correct to infer that the recommended storage temperatures are too low for apples, at least for certain varieties. Also, the storage life of some apple varieties can be prolonged by raising the storage temperatures slightly.

The general practice in the United States is to hold most all varieties of apples at a storage temperature range of 31 to 32 degrees. This is in accordance with recommendations issued by the United States Department of Agriculture. However, the recent experiments of the Iowa Experiment Station, as well as the results of investigations conducted recently in England and New Zealand, have shown that certain varieties of apples have a longer storage life at temperatures slightly higher than those usually employed in the United States. The disease once known as "flesh collapse" in Australia and New Zealand, is now recognized to be the same as "internal breakdown" in England, which is caused by too low a storage temperature.

It appears desirable to store certain varieties of apples at a temperature slightly higher than 32 degrees, provided the apples remain in good marketable condition. With Grimes, it was found that the apples were not only marketable and in good condition at 36 degrees, but their condition was a decided improvement over the condition of the apples remaining sound at 30 and 32 degrees. The improvement was in the flavor and in color. There was no increase in rots or in apple scald.

When Grimes apples are picked at the proper maturity, their color is not uniform. It averages a green or yellowish green color. Usually the eating stage has not yet been reached. If stored at once or a day or two later, at 32 degrees, a color change is hardly noticeable after three months of storage. The color is not then a good Grimes "Golden" color, but a decided green. Although there has been a decided improvement in flavor from the time of picking, there is still a lack of the real Grimes flavor. In fact, it has been observed that these Grimes never attain the desirable flavor characteristic for this variety. When Grimes are delayed a

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couple of weeks before storing, there is an improvement both in color and in flavor, which is noticeable at the end of the storage period. However, this treatment does not give the ideal storage condition. Besides, such fruit has been found to be very susceptible to soggy breakdown.

When we store the fruit at 36 degrees immediately after picking, the characteristic golden color and Grimes flavor both develop. This development, although rather slow at 36 degrees, is certain to take place. If we delay the apples two weeks or even three weeks in a shady, cool place at the orchard, 36 degrees is still the most favorable temperature for this variety as compared to 30 and 32 degrees. This is true from the standpoint of better eating quality as well as on the basis that no soggy breakdown develops.

Rots and Scald Also Checked at 36 Degrees Fahrenheit

The question of loss encountered through rots at the higher temperature is easily answered. Over a period of years when well graded, high quality fruit has been stored, the increase in loss due to rot fungi at 36 degrees has been very slight. The amount can be considered a negligible quantity. The disadvantage, if any, of storing at 36 degrees, due to increased rotting of the fruit, is indeed small as compared to the benefit derived through the prevention of soggy breakdown.

The increased tendency to apple scald at the higher temperature is not sufficient to discount the benefit derived by the elimination of soggy breakdown. In the investigations cited above, oiled wrappers were used, and it was found that apple scald was reduced to a minimum or was entirely controlled. It is important that the oiled paper used measures up to the necessary specifications for the kind and amount of oil present. Good results on scald control have been secured by using wrappers containing 16 to 20 per cent of their weight in oil, but still better results have been obtained when the amount was from 20 to 22 per cent. A sufficient quantity of shredded oil paper should be used when the apples are packed in barrels or baskets.

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The best practice is to plow under all trash and litter of the sort in the fall and to plant rye. Decayed fruit under the trees should be removed and destroyed. Some growers will say that this is too much trouble and that they do not have the time. Nevertheless if they do not do this, it is very likely that the cost of disease and insect control will be extremely high and the cost of this work of sanitation will be paid for many times in the loss of fruit and the extra expense of spraying. Furthermore, some diseases and insects may develop to such an extent that proper control is practically impossible.

Peach growers have tried to control brown rot with summer sprays when the trees were covered with "mummies" of the diseased fruit of last year, and the ground covered with the dried, diseased fruit that acts as a source of infection on the new crop.

Dead wood and prunings should be burned, since they act as sources of further spreading of disease and insects. Black rot, one of our common diseases of the apple, is spread from dead wood left in the orchard.

A practice generally followed is that of scraping the rough bark from the trunks of the mature apple trees in order to destroy insects and do away with a suitable place for them to winter over. This practice is permissible and advisable, but one should understand that this rough bark on the trunks of mature trees does not necessarily indicate a diseased condition.

Diseased wood in the trees should be removed and burned. Bitter rot, blotch, black rot, blister canker, and other troublesome diseases are carried over in cankers formed in the tree and are, therefore, a source of disease dissemination. Some varieties like Ben Davis are more susceptible to such diseases as bitter rot and blotch, and care should be taken to see that the diseased wood is removed.

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"Soggy Breakdown" a Storage Disorder

at 30 and 32 degrees Fahrenheit, but more severely at 30 than at 32 degrees. Again, at 36 degrees and in common storage, it made no appearance or was of no significance. In 1926, two different air-cooled storage houses were used with the same result.

The disease can be best described from its characteristics as it occurs on Grimes and Wealthy. It has not occurred on Jonathan, Northwestern Greening, Arkansas (Mammoth Black Twig) or Willow Twig. At the present time we have a number of other important commercial varieties in our tests. The disease develops as soft brown tissue in the flesh of the apple, in the portion known as the cortex. This part of the apple is just outside of the ring formed by the 10 main vascular bundles. A zone of brown tissue gradually appears when apples become affected (Figure 2). In most cases there is no external browning or softening, so that the disease can only be detected by pressing firmly on the fruit. If the apple is severely affected, it easily yields to the pressure of the hands and caves in at the place where pressure is applied. When first removed from storage, the affected tissue is somewhat firm, tough and rather juicy. Because of its sogginess and moist consistency, the writers have called the disease "soggy breakdown." We have used this term in order to discriminate from "old age decay," which is characteristic when ripening has progressed to the extreme and when the fruit becomes mealy. Old age decay or internal breakdown may better be called "mealy breakdown." (See Figures 3 and 4.) Full descriptions of these two types of breakdown are given in Research Bulletin No. 115 recently published by the Iowa Agricultural Experiment Station.

Behavior of Soggy Breakdown

Aside from low temperature as being the primary cause, it was found that other factors greatly influence the development of soggy breakdown. One of these is earliness or lateness in picking. Another is the amount of delay intervening between picking and storing. As a general rule, it has been found that soggy breakdown increases as the period of delay before storing is lengthened. It was found that when fruit was stored immediately or a day after it was picked, little or no breakdown occurred. This held true when the fruit was picked at the beginning of the harvest period. However, when picking had been delayed until the fruit was slightly overmature, a considerable amount of soggy breakdown occurred even on the fruit which was stored immediately, but of course only at the lower range of temperature (30 to 32 degrees). The apples which are most susceptible to the low temperature breakdown are those which have reached a certain degree of maturity, that is, a point where the ripening processes have continued up to a certain level. When this level has been reached and the fruit is suddenly placed in a room where the temperature is from 30 to 32 degrees, it becomes very susceptible to soggy breakdown. There is also evidence to show that when ripening has proceeded slightly beyond this level of maturity the apples are no longer susceptible to the disease.

Time of Occurrence of Soggy Breakdown

Soggy breakdown on Grimes begins

(*Continued from page 4*)

to appear about the second week in December. The exact time of its initial appearance is dependent upon the extent of ripening which takes place previous to storage at low temperatures. The disease occurs earlier and more severely at 30 than 32 degrees. It has been observed to a certain extent at 34 degrees, but was only of significance on fruit which had been delayed three weeks at the orchard. The seriousness of the disease is increased as the storage season is prolonged. Soggy breakdown was two to three times as severe on January 11 as it was just a month earlier, for the storage season 1925-26. In February of the same season, it had increased from two to three times as much as it had been in January. Apples have been kept repeatedly until the middle of May at 36 degrees and in common storage, without the occurrence of soggy breakdown, when comparable lots had become seriously affected by December 20 at 30 and 32 degrees.

Whether or not the prevalence of soggy breakdown varies according to seasonal conditions, has been noted in the experiments. Practically the same amount of the disease occurred in 1925 as in 1924. In 1926 soggy breakdown was only about one-half as abundant as it was in the other two seasons. Weather bureau records were consulted for the three seasons. However, the lower amount of breakdown noted in 1926 could not be accounted for on the basis that there were differences in the total seasonal rainfall or mean temperatures for the growing seasons. It is believed that if the fruit could be handled under exactly the same conditions each season, the disease would be present in about the same proportion each year.

Susceptibility of Apples from Different Localities

The question arises as to whether the fruit used in these experiments was for some reason peculiarly subject to this type of breakdown because of local conditions. An experiment carried out in 1926 gave some light on this point. Some Grimes were obtained from the Wenatchee district, from the State Experimental Orchard at Grand Rapids, Mich., and from two different sections in Iowa. The Grimes from Wenatchee and Grand Rapids were shipped to Ames immediately after picking. They were then placed under similar treatments in the various storage rooms, along with Grimes grown at Ames and at Mitchellville, Ia.

Limited space will not permit us to go into the details of the entire experiment, but the result in the main can be given. The apples from all four localities showed severe soggy breakdown development in December, but only at the lower temperature range, as in previous experiments. In all cases, the Grimes kept favorably at 36 degrees Fahrenheit, while the contrasts between the lots stored at 30 and 36 degrees were more striking than ever. It appears then that the disease is not necessarily confined to one locality.

Is a Change in Cold Storage Temperatures Desirable?

From the results of the above experiments, it is correct to infer that the recommended storage temperatures are too low for apples, at least for certain varieties. Also, the storage life of some apple varieties can be prolonged by raising the storage temperatures slightly.

The general practice in the United States is to hold most all varieties of apples at a storage temperature range of 31 to 32 degrees. This is in accordance with recommendations issued by the United States Department of Agriculture. However, the recent experiments of the Iowa Experiment Station, as well as the results of investigations conducted recently in England and New Zealand, have shown that certain varieties of apples have a longer storage life at temperatures slightly higher than those usually employed in the United States. The disease once known as "flesh collapse" in Australia and New Zealand, is now recognized to be the same as "internal breakdown" in England, which is caused by too low a storage temperature.

It appears desirable to store certain varieties of apples at a temperature slightly higher than 32 degrees, provided the apples remain in good marketable condition. With Grimes, it was found that the apples were not only marketable and in good condition at 36 degrees, but their condition was a decided improvement over the condition of the apples remaining sound at 30 and 32 degrees. The improvement was in the flavor and in color. There was no increase in rots or in apple scald.

When Grimes apples are picked at the proper maturity, their color is not uniform. It averages a green or yellowish green color. Usually the eating stage has not yet been reached. If stored at once or a day or two later, at 32 degrees, a color change is hardly noticeable after three months of storage. The color is not then a good Grimes "Golden" color, but a decided green. Although there has been a decided improvement in flavor from the time of picking, there is still a lack of the real Grimes flavor. In fact, it has been observed that these Grimes never attain the desirable flavor characteristic for this variety. When Grimes are delayed a

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couple of weeks before storing, there is an improvement both in color and in flavor, which is noticeable at the end of the storage period. However, this treatment does not give the ideal storage condition. Besides, such fruit has been found to be very susceptible to soggy breakdown.

When we store the fruit at 36 degrees immediately after picking, the characteristic golden color and Grimes flavor both develop. This development, although rather slow at 36 degrees, is certain to take place. If we delay the apples two weeks or even three weeks in a shady, cool place at the orchard, 36 degrees is still the most favorable temperature for this variety as compared to 30 and 32 degrees. This is true from the standpoint of better eating quality as well as on the basis that no soggy breakdown develops.

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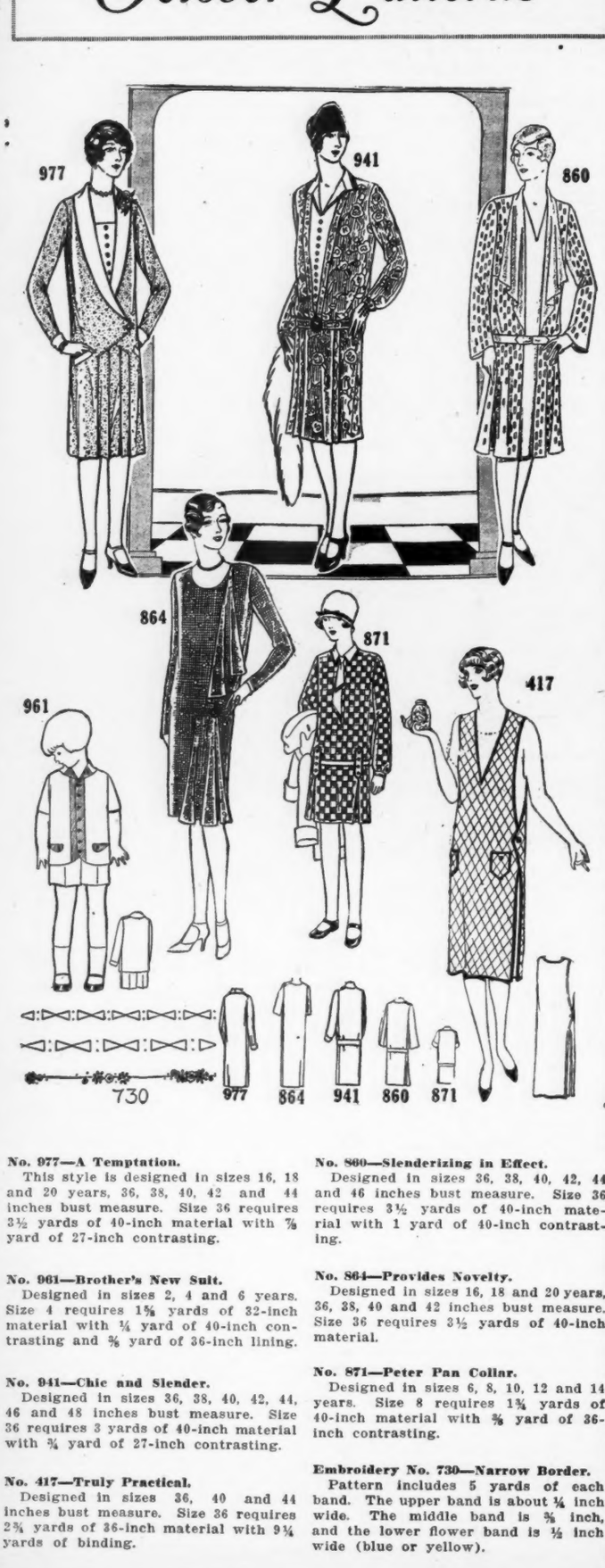

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Picking, Handling and Exhibiting the Apple

(*Continued from Page 3*)

extent. If they start to drop or soften on the tree, they must, of course, be harvested. The eating quality of early picked apples tends to be poorer than that of later picked fruit. Storage scald has been found to be reduced by allowing such varieties as Grimes, Huntsman, and Golden Delicious to become fully hard ripe before picking.

There are definite signs and indications not mentioned above, which are used by growers to tell whether or not their apples are ready to pick. Most of these are not dependable. Color of seeds is often used. In some cases the seeds are brown weeks before the apples are ready to pick. The development of a large amount of red color does not give satisfactory evidence that apples are ready to pick. The poor eating quality of some apples from the Pacific Northwest is due to the fact that they are picked when completely covered with red over color, but have not really matured properly. The ease of separation of the stem from the twig is also deceiving, as it is influenced by climatic conditions.

Utensils for Picking

Apples for a fancy market should be picked in suitable containers, care being taken at all times not to bruise the fruit or puncture the skin. The commercial apple crop is usually picked in picking bags or aprons. The apples should not be allowed to fall a long distance into the container, and the picker should not let his picking bag or apron bounce from round to round of the ladder when descending. Reasonable care should be exercised in dumping the fruit into the barrels, boxes, or on the packing table. Fruit should always be removed from the tree by means of a sideways twist. The practice of pulling off fruit, spur and all, should be avoided, as it may reduce the number of spurs sufficiently to affect later crops.

Handling Fruit Between the Tree and the Consumer

The softening of fruit after picking depends mainly upon the temperature. Sealing fruit in air-tight jars, or coating it with paraffin and the like, will delay softening, but aside from these exceptional conditions, temperature is the controlling factor in the softening of fruit. In general, fruit should be kept as cool as possible after picking. If several days elapse between picking and packing, the fruit should never be piled up under the trees or left out in the sun. If a cellar is available, it should be used for storing between the operation of picking and packing. Fruit picked during the day may be left outdoors during cool nights to lower the temperature, and put in the cellar early the next morning. The management of common storage of any kind is quite simple. Open every door, window, or other aperture during the cool nights in order that the cool night air may surround the fruit. Close every opening during the day to keep the cool air in and the warm air out.

In many cases cellar space will not be available. It is better to store fruit under some shelter rather than directly in the sun as some growers do. The same thing applies to the packed fruit. It should be kept as cool as possible and should never be piled in the open where it will be exposed to the sun. After packing, the fruit should be rushed as quickly as possible to the refrigerator car or cold storage. If delay is necessary, a cellar, above-ground common storage, or a shed should be used.

The results of experimental work show that apples soften more in a week at outside fall temperatures than in several months in cold storage. Jonathans may become as soft as they ever get in 10 days outdoors at the temperatures prevailing at picking time. The good results of careful culture, spraying, picking, and handling are often lost by a delay in getting the fruit into storage. This delay, of course, may be unavoidable. Often, however, by exercising ingenuity or by making previous arrangements with the buyers or storage men, delay in moving the packed product may be avoided.

Selecting the Fruit.—A good fruit exhibit usually depends more upon the ability of the grower to select prize winning fruits than upon other factors. Ordinarily, the best fruit for show purposes will be found near the top of the tree or upon the outermost branches where it is exposed to an ample supply of sunlight. The essential factors to keep constantly in mind are: (1) freedom from blemish; (2) uniformity of the individual specimens; (3) good typical color for the kind; and (4) characteristic size and shape for the variety. These requirements will be given further consideration under the discussion of the score card.

Care of the Fruit.—Much will depend upon the care and attention given to such matters as picking, handling, storing and transporting. If the exhibitor is careless, or negligent in any one of these factors, it may mean failure. Pick apples with stems on.

The Placing of Exhibition Fruit.—Superior fruit if not placed or arranged in an attractive, neat and artistic manner, may receive a low score and win no prizes. If the table, for example, is covered with green crepe paper instead of white, yellow, or black paper, the contrast in color brought out between the green paper and the red and yellow fruit will heighten the effectiveness of the exhibit. It is also important that the correct number of specimens be placed on each plate. This will vary somewhat, depending upon the rules of the particular fair or association concerned. Five specimens are generally required. When fruit is exhibited in containers such as boxes, baskets, barrels or other receptacles, the same careful attention to its appearance and artistic arrangement should be given. For success, conformity to the standard rules for packing, grading, and quality should be carried out in the strictest detail.

Score Card for Apples.—A careful study of the score card will acquaint the exhibitor with the value of the most important points to be considered in the selection of fruit for show or exhibition purposes. For single plates, the score cards may be as follows:

SCORE CARD FOR APPLES

Freedom from blemishes	30
Uniformity	20
Color	20
Size	15
Form	15
	100

Freedom from Blemishes.—This is

the most important single point on the score card. It means that each fruit should be absolutely free from insect and disease injury, such as San Jose scale, codling moth, curculio, apple scab, blotch, black rot, frost injury, spray burn, limb rub, etc. Each specimen should be as nearly physically perfect as it is possible to select it. Apples having mechanical injuries, such as bruises, twig punctures, box or barrel bruises, should be carefully eliminated. If only one specimen of the five or more shows any of the injuries or blemishes listed above, it may prevent the exhibit from winning a prize even though all the other specimens are perfect.

Uniformity.—Many exhibitors fail to recognize the importance of this point. Uniformity means that all the specimens on one plate should be of the same size, color, shape and degree of ripeness. Every specimen should be as nearly like every other specimen as it is possible to make it. Four large apples and one medium sized or small apple, for example, will not score as high as five medium sized apples. Moreover, five apples of the same size with one lacking color as compared with the others will not make as good a score as five apples a little smaller in size but all of the same color. It is also important that all the specimens have the same shape.

Color.—The fruit should have the color characteristic of the variety. If the variety is red, try to select all the specimens exactly like the one typical for the kind. Four red specimens and one splashed with green or yellow would receive a lower score than five fine specimens colored with splashes of green or yellow.

Size.—Exhibitors frequently select for show or exhibition purposes the largest specimens obtainable. This is generally a mistake, because this extra large size is not typical for the variety and it is often difficult to procure all the fruit of the same size.

Form.—This has to do with the general shape or form of the fruit. Every fruit grower should know the form typical for the various varieties. Fruits for show or exhibition purposes should all have the shape characteristic for the sort.

Duke Cherries Deserve Attention

DUKE or hybrid cherries deserve more attention from fruit growers than they now enjoy, declares Dr. U. P. Hedrick, of the New York Experiment Station, Geneva. The Dukes are hybrids between sweet and sour varieties and possess many of the characteristics of the parent sorts.

Duke cherries are much hardier than sweet cherries and a little less hardy than sour cherries. In size and flavor they are, as a rule, midway between the two, although in the main they resemble sweet cherries more in size, shape and color, and have the somewhat acid flesh of sour cherries. They are particularly valuable in regions a little too cold for sweet cherries and for persons who like mildly acid fruits.

The Dukes respond to the same care and attention given other cherries, although in most regions they are more easily cared for than sweet cherries. They ripen between the sweets and sours, but the late varieties such as Late Duke and Reine Hortense, hang on the trees without cracking or rotting much longer than any of the sweet cherries.

The four best varieties commonly listed by nurserymen are May Duke, earliest to ripen; Royal Duke, midseason; Reine Hortense, medium late; and Late Duke, very late.

Filtration Prevents Boiled Taste in Pasteurized Cider

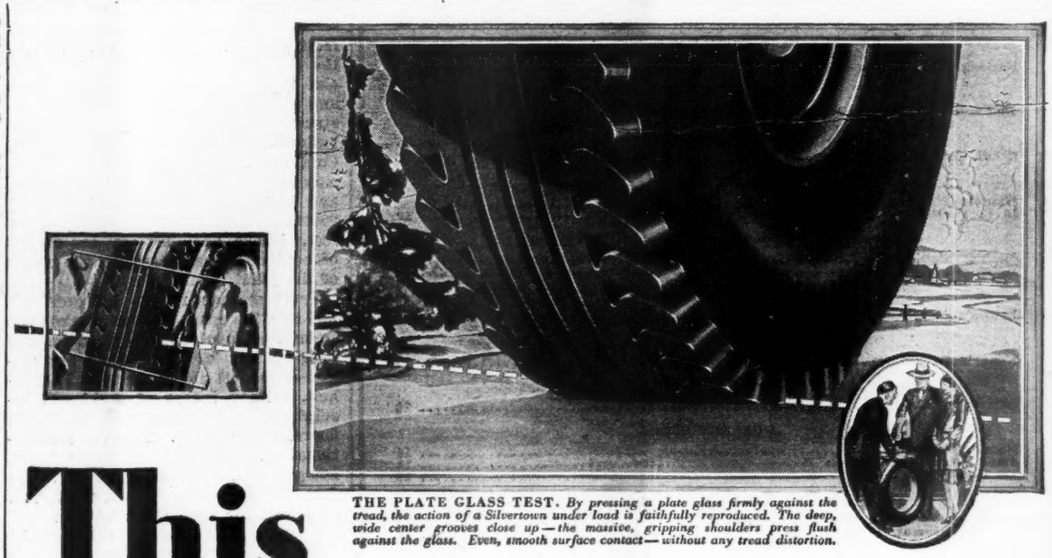
VERY FEW of the varieties of apples commonly grown make a satisfactory cider when only one variety is used, says the United States Department of Agriculture. Most varieties have been selected and are grown because of their eating qualities, and as good eating apples they lack a certain tartness and sprightliness desirable in cider. In order to make a cider that appeals to most tastes, it is necessary to modify the rather insipid juice obtained from most eating apples by blending it with the more acid juices from cooking or crab apples.

Over a period of years the department has obtained data on more than 500 varieties, including crab apples and other astringent apples, as well as practically all the important varieties found in commercial and home orchards. The manufacturer of cider is able to determine from this information what varieties to use in making a blended product of palatable character.

Other studies have developed improved methods of clarifying cider to remove the objectionable muddy or cloudy appearance when pasteurized and bottled. Filtration, with the aid of purified infusorial earth, gives a beautiful, permanently clear liquid. This process also removes certain substances which otherwise would, during pasteurization, undergo changes to cause a boiled or cooked flavor. With this improved method, filtration can be applied to juice immediately after pressing from the fruit, so that the whole process of preparation and pasteurization in the final containers can be carried out in a few hours. It is much less laborious and costly than the older method of pressing, pasteurizing and storing for settling, filtering, bottling and pasteurizing a second time.

As a result of the information acquired through these and other studies, the department is in a position to advise cider makers, as well as makers of other fruit juices, as to the selection and blending of fruits, the process of extraction, clarification, bottling and filtration.

In a recent survey of a typical farm area in an eastern state it was found that sickness in villages is 60 per cent greater than on farms.



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—Permitting the tread to flatten

—and the massive, deep-notched shoulders to bear their share of the load.

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For in these closing grooves—the visible action of the famous Goodrich balloon principle of "center flexibility"—you find the reason for the record-breaking performance of Silvertowns.

Vast Goodrich factories at Akron, on the Pacific Coast and in Canada are working at peak production to keep pace with Silvertown demand.

New low prices further reduce the cost of Silvertown mileage and safety. There is a Goodrich dealer near you!

Goodrich Silvertowns

Goodrich Silvertowns deserve the dependability of Goodrich Inner Tubes.

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Index to Advertisements

The concerns whose advertisements appear listed below are equipped to give prompt and satisfactory service to the American fruit grower. Most of them issue literature that is freely at the disposal of our subscribers. It is to the advantage of all that when writing to an advertiser you use the address exactly as it appears in the advertisement, and that you state in your letter: "I Read Your Advertisement in AMERICAN FRUIT GROWER MAGAZINE."

NOTE: Consult the CLASSIFIED DEPARTMENT (self indexed), on page 16 for Classification not listed below.

AUTOMOBILES

Chevrolet Motor Car Company....Third Cover
Chrysler Sales Corp. (Plymouth).... 17
Oakland Motor Car Company (Pontiac).... 9
Nash Motors Co.... 13

AUTO TRUCKS

Graham Brothers 11
International Harvester Company.... 15
Chevrolet Motor Car Company....Third Cover

BATTERIES

National Carbon Co....8, 12

FARM LIGHTING PLANTS

Delco-Light Co....Second Cover

FERTILIZER

Chilean Nitrate of Soda Educational Bureau.... 10

FEATHER BEDDING

American Feather and Pillow Co.... 16

FLASHLIGHTS

National Carbon Co....8, 12

FRUIT PACKAGES

Pierce-Williams Company.... 12

GASOLINE

Ethyl Gasoline Corporation.... 21

INSECTICIDES

Sherwin-Williams Co....Back Cover
B. G. Pratt Co.... 10

HOTELS

Deshler-Wallick 14
Hotel Empire.... 14

JACKETS

Brown's Beach Jacket Co.... 12

KENNEL SUPPLIES

Kennels Supply Co.... 14

LOG SAWS

Ottawa Mfg. Co.... 12

NURSERY STOCK

Neosho Nurseries.... 14
Stark Bro's Nurseries.... 12
Tenn. Nursery Co.... 16

TILLAGE TOOLS

American Fork and Hoe Co.... 12
Cutaway Harrow Company.... 14

TIRES

B. F. Goodrich Rubber Co.... 19

TRACTORS

International Harvester Company.... 15
Cleveland Tractor Co....Second Cover

TREE GUARDS

Wright Steel & Wire Co.... 16

Do a Favor to Your Neighbor

There is a neighbor living near you, a fruit grower. You know he is trying to do his best, for he frequently asks you what to do and when to do it, and you are always glad to give him the information.

If you think he would be benefited by the expert advice he would receive every month through the AMERICAN FRUIT GROWER MAGAZINE, why not call it to his attention? He would thank you for the courtesy.

When you are through reading this issue, loan this copy to that neighbor, first placing a big black "X" in the margin opposite this coupon. He'll get the point and grasp this opportunity to better his methods. Better reach for your pencil and do it now.

Your Neighbor, in all likelihood, will avail himself of the opportunity to use this coupon

AMERICAN FRUIT GROWER MAGAZINE
53 West Jackson Boulevard, Chicago, Illinois

Gentlemen: I enclose a dollar. Send me AMERICAN FRUIT GROWER MAGAZINE three years.

Name .....

Address .....

Insulation in Fruit Storage

(Continued from Page 5)

properly installed, *stays* dry and retains its full insulating value indefinitely.

Moreover, corkboard has structural strength and is easily installed in any kind of construction. It is light in weight, easily handled, can be cut and sawed like lumber, and erected either by nailing to frame construction or in asphalt or portland cement against brick, tile, concrete, or stone. The insulation is always applied on the inside surfaces and may be finished on the walls and ceilings with plaster or with a special asphalt mastic. The latter is ironed on the corkboard at the factory and is especially desirable where there is much moisture in the rooms. Corkboard is made in standard size boards, 12 by 36 inches, and in one, one and one-half, two, three, four, and six-inch thicknesses.

Types of Rooms and Their Insulation

No attempt can be made here to describe the kinds of rooms required for fruit storage. With the exception of the precooling plant, which is a special type, they differ chiefly in size and shape and in such details of construction as may be required by the buildings in which they are erected. Cold storage rooms, cork insulated, may be as large as the service requires, and it is perfectly practical to build rooms as small as six by six by seven feet. Racks, shelving, etc., are details of equipment varying with the needs of the plant.

Fruit storage rooms, however, all fall into the same class as regards the amount of insulation required for the temperatures at which they are carried—from 32 to 40 degrees Fahrenheit. Four inches of corkboard insulation should be used on the walls, floors, and ceilings. There are exceptional cases requiring less or more, but generally speaking, experience has demonstrated the economy of this thickness for such temperatures.

Four inches of corkboard may be erected either in one layer of that thickness or in two layers of two-inch. The former costs a little less for the labor of putting it up, but the two-layer work is, at least in theory, slightly more efficient, as the joints are all lapped between the layers.

Wall, Ceiling and Floor Insulation

When erected against frame walls or ceilings, the best practice is to sheath the studding or joists with seven-eighths inch boards. A course of odorless insulating paper should then be tacked to the sheathing and the first layer of corkboard erected against this in hot asphalt cement and nailed. When a second layer is used, it is erected in the same manner against the first, breaking joints between layers.

Against masonry walls, the first layer may be erected in a half inch of portland cement mortar or in hot asphalt cement. In the latter case the wall should first be mopped with hot asphalt. A second course, if used, is erected against the first in hot asphalt and additionally secured by nailing.

On concrete or tile ceilings, the first layer of corkboard is laid up in portland cement mortar and propped for 48 hours. The second course is erected the same as the second course on walls. In the case of new buildings with concrete ceiling slabs, the first course of corkboard may be laid in the forms before pouring the concrete.

Floors are insulated with one or two layers of corkboard laid on the sub-floor in hot asphalt. Where possible, the sub-floor should be depressed by the thickness of the insulation so that the finish floor will come flush with the floors outside the room. This eliminates a threshold and makes it easier to truck in and out of the room.

There are variations from these forms of construction, as, for example, where there are no walls or partitions to receive the insulation. In this case, they may be built up as self-sustaining cork walls, one layer or two, without other support. Suspended ceilings may also be built of corkboard laid between tee-iron supports.

The wall and ceiling finish may be either portland cement plaster one-half inch thick, applied on two coats, or asphalt mastic ironed on the corkboard. The best finish floor is three or four inches of concrete, depending upon the nature of the traffic over it.

Multiple Rooms

Where considerable storage space is required, it is good practice to build a group of rooms rather than one large room. Different kinds of fruits can then be stored separately. Only those rooms that are needed at any one time need be refrigerated, which is much more economical than keeping a large room cold to hold a small amount of stored goods. If two or more rooms are built, they should, if possible, be built together in a line, or one over the other if on different floors. Such groups cost less to build, insulate, and refrigerate than separate rooms. Anterooms are advisable for large rooms and along the front of a group of rooms. The ante-rooms make it unnecessary to open the storage rooms directly into the outer air, thus conserving refrigeration and helping materially to maintain uniform temperatures in the storage rooms.

In precooling plants, the rooms are usually built and insulated like other cold storage rooms, but instead of being cooled directly from the coils, they are usually refrigerated by forced circulation of cold air. This involves a system of insulated ducts. The requirements vary considerably and no details can be given in so brief an article.

Insulation Service

Corkboard manufacturers maintain engineering departments which are prepared to render advisory service to plant owners, architects, and engineers on the design and insulation of cold storage rooms. There is no charge for this service and those persons who contemplate building such rooms should take full advantage of it in order to avoid mistakes and to insure permanence of construction and operating economy.

The fruit and produce industries have long since passed the point where they can hope to operate profitably without ample storage. With the recent rapid development of small refrigerating units, storage is perfectly practicable right at the orchards or on the farms, and the grower is thereby enabled to conserve his products and is in position to take full advantage of the market conditions instead of being forced into an unfavorable market in order to prevent spoilage and loss. A properly designed and well-insulated cold storage room can be built for a reasonable amount, and it will pay for itself many times over in increased profits.

Science Teacher—Name some liquid that won't freeze.

Bright Pupil—Hot water.—*Answers.*

Picking and Packing Apples for Market

(Continued from Page 7)

barrels when ready. A second man does the facing, and a third, who should be a good apple man and foreman of the gang, empties the baskets and assists in the sorting. He inspects the fruit when sorted and directs the work. This leaves three men who do nothing but stand at the table and sort.

If the pickers are not able to keep the table supplied, a man from the table is put into the trees to pick until a balance is restored.

If you have good fruit and it is worth enough money on the market to warrant you in doing so, you should make two grades, one strictly No. 1 or Fancy grade, and another which will take fruit that is slightly defective but good for immediate use, commonly termed No. 2 on the market. Usually it will pay as well or better to sell this No. 2 fruit to the evaporator or cider mill or to some peddler instead of putting it in expensive barrels. Another advantage in selling to the cider mill or the evaporator is that you take it out of the green fruit market and transfer it into the market of dried fruit, where it does not come into competition with your green fruit.

Face the barrels with good, well colored apples of even size, put in another layer of similar fruit on top of the facers, then fill your barrel with apples free from blemishes and of even size. Settle the fruit in the barrel as each basketful is emptied in, by shaking the barrel. This is very important, as the fruit should fit tightly in the barrel. It will then require less pressing of the head to keep the fruit compact and consequently less bruising of the fruit.

After the barrel is full and the fruit well shaken down, adjust the apples on top so that they are as nearly level as possible. This will insure equal pressure throughout the barrel, and the barrel will present a much better appearance on being opened.

Stamp the name of the apple on the faced end of the barrel. No. 1 fruit should also be stamped with your name and the name of your orchard, if your orchard is named. On your No. 2 fruit, leave your name off, but stamp the name of the apple.

When shipping to a commission house, they will furnish a numbered stamp. This, instead of your name, will be used in making returns. In hauling barreled apples to the car and in shipping, lay the barrels on the side; never stand them on end if you wish the fruit to remain tight in the barrels.

Wiring the Fruit Farm Home

(Continued from Page 7)

electricity. In the kitchen, receptacles should be provided for such equipment as electric irons and other electrical kitchen equipment. Similar provisions for electric appliances used on the table should be made in the dining-room. If a vacuum cleaner is to be used, wall or base receptacles in every room where it will be utilized will save unscrewing bulbs from overhead fixtures to make room for the vacuum cleaner plug.

Electric outlets on the exterior of the home should not be forgotten. A lighted porch makes a comfortable reading and sewing space on summer evenings if electric light is available.

There will be innumerable variations from the suggested wiring points mentioned here. Each home will have its own individual problems. But thoughtful planning, accompanied by a tour of each room to determine just what uses electricity can be put to within its four walls, will result in a far more satisfactory wiring installation than a hurried and incompletely planned installation.

Above-Ground Storage Equal to Cellar Type

PROPERLY constructed above-ground storages for fruits and vegetables will prevent freezing just as well as cellar storages, according to Prof. E. R. Gross, agricultural engineer for the New Jersey College of Agriculture, New Brunswick. The common idea that safety from freezing can be found only in cellars is not based on fact.

The above-ground storage is more satisfactory from the standpoint of convenience in handling the fruit and in ease of ventilation. Moreover, it costs no more to construct a well-built above-ground storage than it does to construct the well-built cellar.

The above-ground storage should have tight walls and proper insulation to prevent freezing of stored products. Suggested materials for insulating purposes include granulated cork, sawdust, shavings, insulating wallboard, insulex, cabots quilting, flaxlinum or the like. The thickness of the insulating materials depends upon the lowest prevailing temperature, the duration of the storage period, and the general management of the storage.

Even old buildings may be remodeled to make good storages by repairing the weather boarding to make it tight; then ceiling inside with one or two layers of wallboard. This construction will serve for fall and early winter, or for mild conditions. For more extreme weather, the walls should be filled with cork, sawdust or shavings. When these latter materials are used, they must be kept dry. This can best be done by using building paper between the weather boarding and the insulating material. Three inches of cork or four inches of sawdust or shavings will, with proper construction and management, resist zero weather. Other materials must be used in thicknesses depending upon their insulating powers, which vary considerably. Ample ventilation is very important in all storage houses.

Mr. Brown and Mr. Jones both ride with ETHYL —but for entirely different reasons!

MR. BROWN is a thrifty soul. He knows exactly what it costs him to run his automobile. He can give you the cost per mile of tires, oil, gas and depreciation.

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Ethyl Gasoline is colored red for identification only. It's tetraethyl lead in Ethyl that "knocks out that 'knock'."

EVERY DAY more Mr. Browns and more Mr. Joneses are meeting at Ethyl pumps. (So are their wives). In fact, at hundreds of gasoline service stations, the sales of Ethyl Gasoline now exceed the sales of ordinary gasoline. For there is nothing else like Ethyl. It is good gasoline *plus* ETHYL "anti-knock" compound, a product of General Motors Research Laboratories. Try it.

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WITHIN THE PAST month both presidential candidates have given amplification to their respective "Farm Relief" programs, with the result that a tangible difference begins to appear in the two methods of meeting the situation. Taking up the consideration of the two proposals in the same chronological sequence as they were given, we look first to the address of Mr. Hoover, at West Branch, Iowa, in which he enlarged on the subject of Agricultural Relief.

Candidates Amplify Farm Relief Programs

Mr. Hoover apparently looks upon the agricultural situation as one that can be solved without recourse to subsidies of any kind. Cheap transportation looms large as a relief factor.

But lower transportation alone or increased tariff protection cannot put agriculture on a parity with other industries; therefore, the creation of a Federal Farm Board, adequately financed from public funds. This Board, declares Mr. Hoover:

> ". . . Will still further aid farmers' co-operatives and pools and . . . assist generally in solution of farm problems . . . especially to build up, with federal finance, farmer-owned and farmer-controlled stabilization corporations which will protect the farmer from the depressions . . . of seasonal gluts and periodical surpluses."

Mr. Hoover expressly limits the activities of the government to the furnishing of "initial capital with which to build up the farmer to the control of his own destinies." He still further drives home this limitation:

> "My fundamental concept of agriculture is one controlled by its own members, organized to fight its own economic battles and to determine its own destinies. Nor do I speak of organization in the narrow sense of traditional farm co-operatives or pools, but in the much wider sense of a sound marketing organization. It is not by these proposals intended to put the government into the control of the business of agriculture, nor to subsidize the prices of farm products and pay the losses thereon either by the federal treasury or by a tax or fee on the farmer."

All-in-all, it is the program of an organizer, familiar with the problems of business on a national and international scale. It must be judged in the light of Mr. Hoover's record for accomplishments along similar lines.

Governor Smith takes a different view of the situation. He says:

> "In the basic cash crops the American farmer raises more than the whole domestic market can absorb. He is, therefore, compelled to offer his whole crop at the price of the surplus that is exported. Putting it in other words: The exportable surplus is offered first in the domestic market and drags down the price of the whole crop."

That agriculture can "fight its own economic battles" through government-financed stabilization corporations alone he does not admit, pointing out that commerce and industry depend for their prosperity and stabilization upon law-created artifices, that control and even interfere with the law of supply and demand.

> "Stabilization corporations made up of voluntary associations of producers can no more stabilize agriculture than the banks of the country were able voluntarily to stabilize our financial system without the intervention of the government in forming the federal reserve system."
>
> "Under the protective system of this country we have interfered with the laws of supply and demand for the protection of industry and labor."

The solution of the farm problem, he declares, "lies in providing a mechanism for the control of the exportable surplus, *with the cost of that control imposed on the crop benefited.*"

The creation of this mechanism he will leave to a non-partisan commission of farm leaders and students whom he pledges to select immediately after election.

Governor Smith, we think wisely, expressly declines to commit himself for or against the exact mechanism of the McNary-Haugen program, leaving entirely to the proposed commission the drafting of the Surplus-Control Act.

His is the program of an experienced lawmaker, familiar with the problems of legislation. It will be judged in the light of Governor Smith's long and successful legislative and executive record.

In This Issue

PICKING, HANDLING AND EXHIBITING THE APPLE. By T. J. Talbert 3
"SOGGY BREAKDOWN" OF APPLES IN STORAGE. By H. H. Plagge 4
INSULATION INSURES ECONOMY IN THE FRUIT STORAGE HOUSE. By H. B. Gates 5
BREEDING NEW FRUIT VARIETIES. By U. P. Hedrick 6
WIRING THE FRUIT FARM HOME. By S. M. Ballard. 7
PICKING AND PACKING APPLES FOR MARKET. By R. B. Rushing 7
Orchard Cultivation Pays 10
Wenatchee Association to Can Cull Apples 15
Seventh Mid-West Horticultural Exposition 15
Preparing Trees and Shrubs for Winter 17
Sanitation in the Orchard 17
Duke Cherries Deserve Attention 19
Filtration Prevents Boiled Taste in Pasteurized Cider 19
Above-Ground Storages Equal to Cellar Type 21

DEPARTMENTS

THE MARKET REVIEW 8
FRUIT FARM ENGINEERING 10
CHATS WITH THE FRUIT GROWER'S WIFE 12
FRUIT FARM POULTRY 13
CLASSIFIED ADVERTISING 16
OCTOBER PATTERNS 18
ADVERTISERS' DIRECTORY 20
EDITORIAL 22

EACH MONTH this office is mailing 2000 to 5000 "Questionnaires" to our readers. Our main purpose is to increase the usefulness of AMERICAN FRUIT GROWER MAGAZINE. Therefore we ask our readers, when a "Questionnaire" is received, to give it the attention they would give to any other plan designed to aid the business of growing and marketing fruit at a profit.

"Questionnaires" Get Helpful Information

Answer as many questions as you can, especially those relating to crop acreage. The compiled replies prove of value in gathering material that will best serve the interests of our quarter-million subscribers.

The publishers take this opportunity to thank the many thousands who have assisted us during the past year with their prompt response and have enabled us to make improvements in the magazine that have increased its usefulness.

All information secured by us in this manner is kept confidential and is disclosed only in compiled form.

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